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'FEASTS AND FASTS!' Start not, reader, at the title! Neither the author nor ourselves mean to frighten you with the ecclesiastical bugbears of former times. Whether either or both be duties incumbent on the Christian of to-day, is no concern of ours, or of the learned barrister's. It is the legal, not the ecclesiastical, part of the subject that we purpose to contemplate with you; and we are much deceived if you will find anything repulsive in it. What popes and bishops and councils decreed, is of less interest in these days, than what the State required, and what, in the strictness of law, it does still require. In this respect, the obligations of our Saxon ancestors, of their Norman successors, of the religious reformers, and of ourselves, cannot fail to be of some interest—of more, perhaps, than at the first glance most readers may suppose. It is a subject, too, in this day, of considerable novelty—we mean to the general reader; and by the author before us it has been treated with a degree of learning, of judgment, and of moderation not always evinced in such superficial times as these. Amidst the commonplace, worn-out subjects which perpetually claim our notice, and the herd of scribblers who take such subjects in hand, it is a relief to meet with one like the present, and by such a writer.

The first of the festivals on which the Christian mind naturally rests, is Sunday, or, as it is more usually termed by ancient writers, the Lord's Day. In this place, we shall not enter into the question how far the successors of the Apostles were justified in substituting the first day of the week for the last; but may remark that the consciences of many were so tender, that they kept both days, and that this was peculiarly the case with the converts from Judaism. And we may also remark that there arose a difference of opinion whether the Saturday should be observed as a feast or a fast. Confining our attention to the Sunday, or Dies Dominica, we are told that from the very first—from the time of Pliny—the divine mysteries were peculiarly celebrated on one particular day, which day was the day we keep holy. Assuming it to be so, (an assumption which can do no harm, since, if it were not observed in his day, it certainly was immediately afterwards) we do not see, for many centuries after the establishment of Christianity, anything like uniformity in its observance, independently of the necessary attendance on the church services. In the Theodosian Code, there is a law of Constantine (A.D. 321) decreeing that on the *dies solis*, "so famed for the reverence due to it," the Forum should be closed to all legal disputes, but leaving it open to the grateful acts of conferring liberty and legal rights—to the emancipation of sons from the paternal authority, and to the manumission of slaves. In like manner, all the populations of the towns are to rest, and the labours of the artisans to be suspended "on that venerable day." But it is worthy of remark that the agriculturist may freely and lawfully attend to the cultivation of the fields; "since it not unfrequently happens that no day is more favourable for committing the seed to the furrows, or the vines to the trenches; and the advantages given us by the bounty of heaven ought not to be thrown away

out of regard to that day." A law of Theodosius (A.D. 386) confirmed the provision as to the cessation of legal proceedings, and the labours of artisans, but left the agricultural exemption just as it was; and so also one of Justinian. Indeed no emperor of the East appears to have revoked this exemption before Leo the Philosopher, who (A.D. 910) condemns it as a dishonouring of the Lord's Day. It is declared to be "of no weight and futile; since not the diligence of the agriculturist, but the virtue of the sun under the influence of the Bestower of the earth's fruits, supplies the abundance of the harvest." He decrees that, in conformity with the good pleasure of the Holy Ghost, as declared by the Apostles ordained by Him, all men shall, on this sacred day, abstain from labour—the prohibition being expressly extended to agriculturists. But long before this time, we have something like a prohibition in the canons and laws of the Western Church. Thus, in A.D. 538, the third Council of Orleans holds that people ought to refrain "from rural work—that is, from ploughing, the culture of the vine, reaping, mowing, threshing, clearing away thorns and weeds, hedging;" and thereby be better able to attend church, and join in prayer. But at the same time, to guard against the spirit of Jewish punctiliousness, which was evidently far from unknown, it observes: "whereas the people are persuaded that they ought not to travel on the Lord's Day with horses, or oxen, and carriages; or to prepare anything for food; or do anything conducive to the cleanliness of houses or men—we have ordained that what was before lawful to be done may still be done." By the Council of Auxerre (A.D. 578) the same law was repeated, in terms somewhat more restricted. But Gregory the Great (A.D. 603), in his injunction to the people of Rome, and after him Nicholas I. in his instruction to the Bulgarians, are more lax in their regulations for the observance of the day. National and provincial councils have always been the most strenuous advocates for its sanctity, while popes and emperors (prior to the tenth century at least) have been the most indulgent. Towards the close of the sixth century, this more stringent spirit begins to manifest itself. Thus the second Council of Maçon (A.D. 585), the acts of which were confirmed by King Guntram, of Burgundy, has not only a decree for the cessation of all legal disputes on the Lord's Day, with a penalty according to the condition of the delinquent (if a layman he was to be punished by the clergy—if a lawyer, to have the privilege of pleading the cause—if a priest or monk, to be confined six months), but it forbids all bodily labour, "except for the preparation of food." In the following century, the Council of Chalons also prohibits rural labour, and threatens offenders with exclusion from the communion. Theodulphus, Bishop of Orleans, (A.D. 797) is more explanatory as to the manner in which the day should be kept holy: he will have nothing but mass and prayers, except the labour necessary for the preparation of food. If travelling on that day be absolutely necessary, licence for it must be previously obtained; and even then attendance on mass and prayers must not be neglected, "if there be opportunity." The earnestness with which similar provisions are enforced by succeeding councils, and by the Carolingian princes, shows that men were quite willing to avail themselves of the indulgence enjoyed in former ages. A successor of Theodulphus, Bishop Jona, would have the people not only to cease from work, but to "divest themselves of worldly cares and anxieties," on that day. By the Councils of Mayence and Rheims, both held early in the ninth century, the cessation from manual labour is strongly enjoined; and,

lest ecclesiastical authority should fail of its effect, the *Missi Dominici*, or perambulatory judges of the emperor, are ordered to enforce it by severe penalties. Thus, if a man were found to have yoked oxen to a cart, and walked beside them, he lost both, and was still subject to ecclesiastical penance. But Nicholas I. (to whose laxity we have before alluded) has no difficulty in allowing travelling, or even fighting, when the Christian soldier finds it either necessary or expedient.

It may here be observed, that there are many cases where, though attendance at church is enjoined, there is no positive injunction as to the cessation from rural and other labour. But this negative argument may not be entitled to much weight; for we must not forget that something like the analogy between our common and statute law has prevailed in most countries; that the ancient unwritten observances, coeval with the existence of any particular society, never ceased to be obligatory; and that when laws were formally promulgated, they were often intended to supply defects in those observances, to declare more fully their meaning where doubts were found to exist, or to restore their observance when fallen into disuse. And we may also glance for a moment at the strange way in which the Church retained its judicial character, long after the original occasion for it had disappeared. There are many canons against the hearing of causes by bishops and the clergy on Sundays and holidays. Thus the Council of Tarragona (A.D. 516) enjoins them to desist from this abuse, and to give up the whole of their time on such days to "the solemnities ordained in honour of God." But on other days, their jurisdiction remains untouched. Of course, it was founded on the expostulations of St. Paul against Christians going to law with Christians before *pagan* tribunals, (which indeed they could not do without acknowledging, indirectly, the heathen superstition,) and on his exhorting them to refer disputes to their own pastors. So long as these ecclesiastical judgments were gratuitously performed, they were felt to be a burden; and we read heavy complaints as to the onerous nature of the duty by many bishops—by none more loudly than Augustine of Hippo. But when such causes brought abundance of "grist to the churchman's mill," he was so far from complaining, that he was quite ready to undertake the burden even on Sundays and holidays—to the neglect of the church service. To neither of these points does Mr. Neale request the attention of his readers: generally, indeed, he is satisfied with a brief statement of the law—leaving comments and inferences to their own judgment.

If from the Continental we pass to the Anglo-Saxon legislation on this subject, we shall have reason to infer, from the severity of the penalties, the greater disregard of holidays by our ancestors than by the rest of the world. The first English law on the subject (in the Collection of Ina, A.D. 693) enacts, that if a master compels his slave to work on the Lord's Day he shall pay a fine of thirty shillings, and the slave be set free. If the slave works of his own accord, he is also to be fined, or if he has no money, to be flogged. A freeman guilty of the offence was to lose his freedom, or pay sixty shillings. The canons of the Council of Berkhamstead (A.D. 697) are similar in tenor, only they make no mention of the slave's enfranchisement; while, on the other hand, they exact a penalty for Sunday travelling,—the slave to pay a fine of six shillings, or to be flogged,—the freeman one according to his condition in life. By Cuthbert, Archbishop of Canterbury (A.D. 747), and by Egbert, Archbishop of York (A.D. 749), tra-

velling and labour on Sundays and holidays are also condemned. Alfred the Great exacts a double penalty from those who *steal* on the Lord's Day, Christmas Day, or Easter Sunday. Labour is strictly forbidden on "the day when the Lord Jesus triumphed over the devil"—that is, Sunday—a fact which Mr. Neale (who is at a loss to know what day is meant) may easily ascertain, if he will search farther. In a treaty between Edward the Elder and Guthrum the Dane, it is agreed that the Englishman who trades on Sunday shall pay thirty shillings; the Dane twelve pence, and forfeit the article. For labour on that or other feast days, the freeman is fined or degraded to slavery;—the slave fined or whipped. Similar prohibitions are to be found in all the subsequent records of Saxon jurisprudence. Edgar also prohibits public assemblies; and he is followed by the Council of Enham (A.D. 1009), and by Canute (A.D. 1032), who prohibit both them and merchandising, with "mundane works" of every kind. The last-named prince declares, like Alfred, that crime on Sundays and Saints' days is more criminal than at any other time: and, like him, he will punish it the more severely.

Under the Norman monarchs and their successors, we meet with provisions very similar in tenor,—a proof that there was still a strong disposition to evade the obligations of the day. Legislation has always a basis: it deals not with imaginary offences, or with such as do not at least sometimes occur. That they occurred frequently, is evident from the earnestness with which these prohibitions were declared. Though trading was as rigorously forbidden in these as in the preceding ages, a relaxation was found, or thought, necessary so far as concerns "the sale of victuals." As might have been expected, this indulgence led to the opening of markets on Sundays, where other articles besides food might be purchased. Archbishop Islip (A.D. 1359) is very wroth on account of the "perverse, nay, undoubtedly damnable, abomination,—of long usage, too, in different parts of the province (Canterbury), namely, the holding of markets on the Lord's Day everywhere and without distinction, to the contempt of the honour of God, for the sale of divers articles, among which victuals were not even to be found." In a subsequent constitution, the same prelate enjoins a cessation from all work, even such as would be useful to the State. His brother of York had still greater difficulty in attempting to preserve the Sabbath from profanation. Archbishop Thoresby prohibits the holding of Sunday markets in churches and churchyards, but says not one word as to their being held in any other place. Archbishop Arundel (A.D. 1401) is compelled to tolerate them during the time of harvest, provided they are not held on consecrated ground. Yet Archbishop Chichele (A.D. 1414) will not even allow barbers to follow their vocation on Sunday mornings. Nay, in the century preceding, we find more than one instance where it was esteemed a sin for a man to shave himself. We have a delectable legend of St. Richard of Cirencester while thus occupied. He saw a fiend carefully collect the hairs as he shaved them off, to be exhibited against him at the day of judgment. By way of penance, he remained half-shaved and unwashed until the Monday. Nor was the feeling confined to England. In 1292 William, Bishop of Angers, hurls the (then) tremendous doom of excommunication against all barbers shaving on Sunday; and though he does not proceed so far as to denounce it on all who shave themselves, he tells them that if they do so, it must be "at the peril of their souls." But such denunciations were vain. In spite of bishops, councils, and kings, there was not only shaving, but marketing on that day,—marketing

of wool and household utensils, as well as victuals; and agricultural labours, at certain seasons, were not suspended through the fear of book and bell.

When the Reformation came, we might expect to find greater strictness of legislative and canonical enactment in regard to Sundays, whatever became of the other holidays. But such is very far from being the case. As our author truly observes, "they (the Protestants) leant decidedly to the side of relaxation." Thus, in the first of Edward VI., "all parsons, vicars, and curates are to teach and declare to their parishioners that they may, with a safe and quiet conscience, in the time of harvest, labour upon all holy and festival days, and thus save what God has sent; and if, through scrupulosity or grudge of conscience, men should superstitiously abstain from working upon those days, then will they grievously offend and displease God."—Wilkins, Concilia, iv. 6. There is surely nothing in the rescripts of the emperors, or in papal briefs, more explicit than this, of which Cranmer was beyond doubt the author. And we may add, that there are no denunciations of Sunday markets for the sale of any kind of commodities, save during the hours of divine service. From the canons of Elizabeth's reign, it is clear that any kind of wares might be sold, in market or otherwise, after the morning service. But there is something more than this: except during that brief suspension, not only might the shops be open, but innkeepers might admit people "to drink, play at cards, tables, or bowls." Of course, he is not enjoined to do so; but he could be fined only for admitting them *during the service*. It was by Elizabeth's influence that a bill brought into Parliament for postponing fairs and markets falling on a Sunday to the following day, was thrown out. James I. was content to leave the laws in this respect much the same as he found them; or at most, to restore them to the state in which Edward had left them. He will not allow shoemakers to display various manufactures on that day, without subjecting them to the penalty of three shillings and fourpence for every pair sold, with the loss of the article. Charles I. endeavoured to be more strict than his immediate predecessors: "Carriers, waggoners, carters, wainmen, butchers and cattle-drivers" had greatly profaned the Lord's Day, "to the great dishonour of God and reproach of religion." To remedy the evil, a fine of twenty shillings was imposed on all who drove teams, and a third of that sum on the butcher who killed or sold meat. The Long Parliament and Cromwell left the law as it stood. The Independents, indeed, looking upon the institution as a human, and not a Divine ordinance, were not likely to enforce its observance.

We will leave our readers to meditate for a week on what will be, to many among them, a new reading of the Puritanical observance of the Sabbath, reserving the close of the question, and a few miscellaneous remarks, for another article.

Economy; or, a Peep at our Neighbours. Ollivier.

THIS is a very light book; but "women must either write or talk," says the opening sentence:—is the authoress forbidden to talk? "The days shall come," says Jean Paul, "when all men (and all women too), from the North Pole to the South, will write!" As a symptom of this approaching climax of authorship, we must regard the impatience with which the most frivolous of summer tours refuse to stay in the inglorious obscurity of manuscript. But this book, though light, has a purpose; for it recommends a trip to Guernsey as a panacea for all the evils attendant upon a want of economy. The authoress has written with the amiable in-

tention of persuading some whose affairs are in a little disorder that there is still hope for them—in Guernsey.

The Channel Islands are not very far distant from Torquay; but our authoress is a reader of Wordsworth, and retains

Of the old sea some reverential fear,
as she exclaims—"Here we are, sixty miles from home!—Nothing to count them by land, but it is a wearisome voyage by sea; and a craven fear will creep in the mind when we know that we *must* pass this ordeal again before we can be in England." Here the writer remembers that "Lot's wife was turned into a pillar of salt by casting one look back"; and, having no wish thus to add herself to the curiosities of Guernsey, henceforth banishes all pining for a far-distant home. The beauties of the island are not all discovered at a first glance; indeed, there seems to be something in the first impression which produces an unfavourable state of feeling:

"And what is the next thing we do? Why we look round on our new position and find fault with everything we see. 'It is so strange!' we say; not recollecting that this is the precise thing we wanted. Thus do the tides of our temperament still ever ebb and flow, and we grudge the meed of praise to all we meet, because it is not exactly such as we have left, or what we have expected. In this morbid, or rather *rabid* state, there is little to be done in teaching abstract rules. It is a strange *mélange*, this life of man!"

We suspect there is a want of adventures for the tourist in Guernsey; but the writer, with good economy, makes the most of such as she finds:—

"The Ariadne has landed her passengers, and is off again for Jersey—I see her quite plain through the telescope. The skipper in his bent hat!—Shall I tell you what he is doing? 'Yes.' He is blowing his nose. Now he is turning round. I suppose he knows the coast too well to have a pilot? But he is looking out anxiously, and standing on the bridge that crosses from paddle-box to paddle-box. There is a gentleman in a cloak, escorting a lady up and down the deck; let them walk whilst they can, for this rough sea will try them. There is a carriage being taken on board; and a boat full of people pulling hard from the harbour—the skipper is looking impatient—the bell rings—the paddles begin to move."

This want of adventures on the island is compensated by the meditative moods inspired by the scenery, of which we have several specimens—e. g.—

"A feeling of repose is given—an abstraction from the hearts of men, that teaches one to feel that all which we have done *for ourselves*, is but lost labour; and the truth is visibly painted, that a little clothing, a little eating, a little cottage, is all that we require. And yet what a vastado we make! what a skirmishing—what a fussing!—and all about—nothing."

Sometimes we have reflections for which we cannot find a motive, unless in the dash which divides them from the narrative, as in the following instance:—

"How beautiful is age! The two extremes assuredly here meet! Youth on one side, age on the other,—it is impossible to say which would gain from us the most admiration. We count—watch—the regular wrinkle, as we do the dimple; whilst the manners are much the same. The young ones have not yet learnt to suspect,—the old have outlived their suspicions. There is an ugly age, an unmeaning age—unadmirable, unpardonable—between the two,—neither one thing or the other. I left off suddenly, and I cannot remember what made me think of all this,—perhaps some very handsome old person; but, *Dieu me pardonne!* I have forgotten."

There are edifying seasons in Guernsey: the preaching at St. James's Church seems to be in the right style,—coming home at once to the feelings of the hearer who has ventured so far away from home:—

"We had a very excellent sermon—the subject the prodigal son. I listened attentively—felt it

quite person that would

But Gu who visit their heart fell in love

"In our pay our composed on

—like a we wrote—is something

The lau scene:—

"To des neither was soft emotion indeed rather curiosity, and selves shou monster this even on the planks, and progress.

"The Rosa o sea! Brea mamma? t then the gu could not h it now,—bu bursting!"

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quite personal—and was prepared to hear something that would do me good."

But Guernsey has other attractions: let those who visit it take care, when they come away, that their hearts are not left behind: for our authoress fell in love with—the gun at the castle!—

"In our survey of the castle we did not forget to pay our compliments to our well-beloved gun, as it reposed on its sunny battery—harmless and peaceful—like a tame, sleeping thing! 'Bang!'—even as we write—it tells us the day's work is done. There is something very charming in our dearly-loved gun!"

The launch of a vessel makes quite a moving scene:—

"To describe it there seems nothing in this,—neither was I prepared in any way to 'cherish the soft emotion,' as a lady says to Warwick. I was indeed rather in a *fuss*; moderating the children's curiosity, and urging them to have a care of themselves should a failure take place, and the great monster thing, whose watermark we did not reach— even on the second floor, swerve from the greased planks, and falling against the house, crush us in her progress. It was in the midst of this feeling that 'the Rosa of Guernsey' took her even course to the sea! Breathless we all stood! 'Are you crying, mamma?' then I am sure we may cry too!" And then the gush of tears and sobs that followed! I could not have believed it—can hardly understand it now—but so it is—the heart was full, even to bursting!"

We have allowed this little book to speak for itself in recommending Guernsey, where profitable meditations and very poetical sentiments may be enjoyed on principles of the strictest economy, and "good Madeira" is only twenty-eight shillings per dozen.

Spain, Tangier, &c. visited in 1840 and 1841.
By X. Y. Z. Clarke.

Another book on Spain! This time (there is no mistaking the internal evidence) we are to travel with a lady. She, we are informed, is not the publisher; that "ask, unknown to her, having devolved on a relative, to whom her observations, in the shape of letters, were addressed. Whether she approve or condemn the liberty taken with her chat (for the volume has nothing better) we know not; but we are quite sure that she owes him no gratitude for it.

From the title, the reader will perceive that the book falls under the same head of condemnation as we have been compelled to pass on Mr. Robertson's recent publication [*ante*, p. 537]—its appearance so long after its composition. Unfortunately, too, it has—like the 'Journal' to which we refer—the more serious defect of being the hasty record of a hasty glance. According to the editor's "Notice," the author was more than eight months in Spain. From the dates of the letters, we learn that she reached Madrid in the diligence on September 29th, 1840, and remained there until the 16th or 17th of February, 1841. In the three following months she proceeds from Madrid to Seville; from Seville to Cadiz, by steamboat; from Cadiz to Gibraltar, by the same mode of conveyance; from Gibraltar to Tangier, by a felucca, and back again; from Gibraltar to Malaga by steam; from Malaga to Granada by way of Loja; from Granada, by steam, to Carthagena; and from Carthagena, by land, through Murcia and Alicante, to Valencia. How much—or rather how little—could be known of the country by such a route, and in so short a period, need not be remarked. As to Tangier, which occupies so prominent a place in the title, she seems to have spent four, or probably five days there; and for any real information she gives us concerning it, she might as well have remained on the European coast. In short, the book is in every respect a trifling one; and this we may say with much lack of gallantry,—always

supposing that the authoress had no hand in the publication. As private letters from one friend to another, they are well enough; but their imprudent publicity invests them with a different character.

After this condemnation of the volume, we might naturally be expected to dismiss it without another word of comment. But as there is no man so vicious as not to have some redeeming quality, so there is no book so bad as not to exhibit something worth notice.

The Spanish muleteers and drivers of every kind are a profane set of fellows, though not quite so bad as those of Portugal. Ugly words, with thumping blows, are applied to the poor animals, which seem to understand what is meant. Whether they are equally sensible of the fine, and sometimes holy names applied to them, we leave their drivers to settle among themselves:

"Then such comical names are given to the creatures, and which they are called incessantly,— 'Coroneia—a, Catalina—a, Magdalena—a, María—a,' &c.; and they seem perfectly to understand the muleteer, to know which among them is spoken to, and which may expect the lash if it do not mend its manners. I have heard a 'San Pedro' very profanely desired to go to the 'Dios! Dios!' and known a 'Santa' so-and-so, as unceremoniously thumped and sworn at, as if she owned a heavenly god-mother."

This, however, is not half so bad as the Portuguese: but it is bad enough. Yet what better can be expected, when the very streets of Madrid had, until lately, such names as "Valgame Dios" (*God help us!*) "Subida de los Angeles!" (*Ascent of the Angels*), "Amor di Dios baja!" (*Love of God below*), "Jesus del Valle" (*Jesus of the Vale*), "Cruz del Espiritu Santo" (*Cross of the Holy Ghost*). All this is certainly not worse than the *Cave du Saint Esprit*, known to Parisian visitors. But in all Roman Catholic countries we meet with such instances of profaneness at every turn. Nor is it confined to the land,—as the "Most Holy Trinity," "The Immaculate Conception," and other designations in the Spanish navy, will abundantly prove.

Like all other travellers, our authoress has not one good word to say for the Queen-Mother, Christina:—

"As for Christina, she seems to meet with little commendation or respect; and to deserve less. I have rarely known any one so generally ill-spoken of. Her own immediate partisans seek to justify her of course; but by everybody else, she is represented as an ill-conducted, selfish, and rapacious woman. Her insatiable love of money is a general subject of conversation. She is said to have sent in calculable sums out of the country, and to have done so for years before she quitted it. It is even asserted she stripped the royal palaces of their ornaments, &c.; an example which has, they say, been copied by various minor fry."

If report be true, she has done worse than this. Since the volume before us was printed, her husband, the adventurer Muñoz, has been charged with dishonest dabbling in the funds,—with her connivance, and at her suggestion. Spain will soon, we suspect, be too hot for her. But she ought not to leave the country with her ill-gotten wealth: she should disgorge to the last real, and live in Italy, (or, if Louis Philippe pleases, in Paris,) on whatever pension the deputies may allow her. If she remain much longer, it is more than probable that her daughter may be expelled with her. She has been plainly and boldly told, (and that notwithstanding the fetters imposed on the newspaper press,) that to win the affection of the Spanish people (which she once had, but has long lost), something more is required than cajoling the soldiery,—than ostentatious prayers,—than religious processions in the streets,—than cringing to the court of Rome,—than intriguing with powerful kings,—than amassing wealth,—than listening to the revengeful whispers of a faction.

Such expostulations will have no effect on her, and none is expected by the men who make them; but they are full of instruction to the rest of the world.

Like many other travellers, our authoress is, hopeless of Spanish regeneration. She sees nothing but what is wrong in the whole frame of society, from the prime minister down to the meanest functionary, and from the noblest grandee to the most petty tradesman. The judges are corrupt; the government has neither the power nor the disposition to enforce the laws against them; the grandees are, with few exceptions, hopelessly involved in debt, while their stewards riot in wealth; the very tradesmen are careless of custom:—

"*** had ordered of a Spanish tradesman (who had travelled in France and spoke French admirably) some article which was promised faithfully for a certain day. Having allowed a few days to pass beyond the time appointed, before he called for his intended purchase; and being then told,—as if the fact were matter of course,—that the article was not begun or thought of, *** remonstrated a little strongly: on which the Spaniard, with his elbows on the counter, and a quiet, unmoved smile on his face, said in French, 'Monsieur apparemment est un de ceux qui s'attendent à tout avoir absolument au moment où cela lui convient;—Monsieur est très mal habitué,—très mal habitué;—' and without attempting to give any further satisfaction, he allowed *** to leave his shop. Nay apparently he quite enjoyed the little fume of the disappointed customer, who had fallen into so absurd a mistake as to imagine that things were done to time and promise in Spain! The effects of such slovenly mental habits need no pointing out."

That bandits must abound in such a state,—where the judges are to be bribed, and subordinate functionaries either privy to the robberies or actors in them,—need not be doubted. To such an extent, indeed, has the system grown, that the moment a traveller crosses the frontier, from that moment his property is at the mercy of the first person he may see on the highway. We have lately read much of the way in which the alcaldes or magistrates of the provinces have discharged their trust; but neither we nor any of our readers could be prepared for the following relation:—

"A rich miller in the country was fixed upon by three persons, as a fit object to be plucked. It so chanced that shortly before the time appointed for the attack of his house, a party of travelling soldiers had requested lodging of him for the night, which he had granted; and these soldiers were sleeping above, when the robbers arrived and demanded his money. The miller told them he would go up and fetch it; he woke the soldiers, and with their assistance killed the three thieves and left them lying. The next day, as it was proper the authorities should be made acquainted with the circumstances, he went to the house of the Alcalde of his *pueblo*, or village, to call him to make his examinations. The Alcalde was not at home; on finding which he proceeded to the next in office, who was not at home either. He then went on to a third:—neither was this one to be found, nor did anybody know anything of either of the three. At last, therefore, he returned home, and prepared to bury the men himself: when on taking off the masks which had concealed their faces,—lo! and behold,—THERE LAY THE THREE ALCALDES!!!"

Of no other country would the story be believed;—that it may be told of Spain, is of itself sufficient to show the state of the country.

The way in which the diligence drivers and conductors manage their business is sometimes whimsical enough. About half a league from Cordova, at midnight, the ponderous vehicle stuck in the mud:—

"When the accident first happened, there was a little hullabaloo,—a little talking and swearing for a minute or two; and then all was quiet. We sat quiet too, knowing we could do nothing, and expecting of course in a few minutes to find efforts making, to extricate us from our ridiculous position. Time

went on:—Yet, not a stir!... 'This stillness seems queer!' said I to myself. 'Have the fellows left us here all alone in the mud, in the dead of the night? or are we put into this large hole on purpose, to be the reader food for their friends, the bandits? I'll know how the matter stands.' So I wriggled myself out of the manifold wrappers which were making a mummy of me, and looked out. The animals had all gone to sleep! mayoral, muleteer, guards, passengers, MULES AND ALL!—they apparently expected a miracle to draw us out. There they were, (the men, not the mules), all packed up comfortably, their handkerchiefs tied over their heads—the guides inserted under the shelter of the luggage at the back of the carriage, snoring nineteen to the dozen.... The case was hopeless.... I drew my head back again into its shell, and tried to go to sleep too! though being 'badly habited,' as the shopman said in Madrid, I cannot affirm that I succeeded in the attempt.... 'It is my first lesson, however,' I whispered encouragingly to myself; 'I shall do better next time!'

Nowhere but in the Peninsula would a public vehicle have been allowed to remain nine hours in such "a fix." Muleteers passed, but they offered not their services, and nobody asked them to do so. After a nap of about five hours, something was attempted. Oxen were brought to draw the diligence from the mud; but the ropes were not strong enough, and they snapped asunder. Perhaps they would gain strength by knots;—no. Iron chains from Cordova were just as ineffectual. At length recourse was had to the expedient which should have been adopted at first: spades and shovels were brought, the mud removed, and the vehicle made to advance, but only to ensconce itself in another soft bed a few leagues further on. Well may our authoress exclaim against such doings, but she is evidently inexperienced. "The fix" was probably a deliberate act, concerted with the highwaymen; and we should marvel at their non-appearance, did we not afterwards read that another diligence which left Madrid the same day, had been utterly spoiled. The case is plain enough: there was a mistake as to the one subject to contribution, and the one paying black mail was unintentionally punished. It may surprise the reader to hear, that though twenty persons occupied the vehicle thus plundered, the number of robbers was only three. The ridicule of the author is natural enough; but here again she has something to learn: the passengers were doubtless unarmed, while their assailants were amply provided with weapons of offence. When fire-arms are found in the possession of passengers, the passengers are always the worst treated: if any attempt be made to use them, the whole party are put to death. This is the law of the road.

Our travelling lady is, like her predecessors, much disgusted with the Moors of Tangier, and (from all that she can hear) of Barbary generally. They are indeed about the most worthless scum of human society. Their hatred to the Christian name is equal to that which they bear to the Jewish. Often, too, they are cruel to one another,—viz. the powerful to the weak. If the Pacha of Tangier suspects any of the inhabitants to be rich, he claps them in prison (charges are easily invented), and they come not out "till they have paid the uttermost farthing." The same thing sometimes happens to the Pacha himself, when the imperial despot at Fez is pressed for money. All ranks are thus internally at variance; and each squeezes the one below it "as dry as a sucked orange." Inhuman in disposition; more perfidious than their ancestors in Roman times; ignorant of everything which men ought to know; and hypocritical as the Pharisees of old or the fakirs of modern times, this detestable people, it is hoped, are drawing near to their term as an independent nation.

Let France conquer them, and welcome: whatever politics may lose, humanity must gain by such a change.

We may here observe that our authoress, like Mr. Robertson and other travellers, is perpetually confounding the Moors with the Arabs. She wonders, and not unnaturally, what is become of the civilization, the chivalry, the honour of the men who conquered, so long ruled, and so much improved, a great part of Spain. A little acquaintance with history would show her and the rest, that the Arabs and the Moors were distinct in language, in race, in character, in everything but religion; that to the former alone Mohammedan Spain is indebted for her glory; that the latter were mere fanatical herds, whom religious impostors called into existence, and led to victory over the Moslems no less than the Christians; that the despots of the Almoravides and of the Almohades had no more affinity with the renowned monarchs who established the sea of their empire at Cordova, than the Turkish sultans have with the Caliphs of Bagdad or Damascus. This error of confounding dynasties so distinct, has been committed by every recent traveller in Spain—at least, by every English traveller. It only proves how useful some small knowledge of Spanish history would be to all who presume to write on the country.

Malaga and Granada are now, so well known, at least to the readers of the *Athenæum*, that we shall not follow our author to either. Murcia and Valencia are out of the beaten track, and of them we might have expected something new. But the custom so generally adopted by travellers of remaining one, or at most two nights, in a town, and of entering that town as ignorant of its local history and antiquities as those of Thibet, is sure to render the expectation vain. If writers, every way unqualified for the tasks they undertake, will rush into print, it should be at their own expense. Such a regulation, if adopted by the booksellers, would soon put an end to the flimsy works that issue from the press. This is the most urgent of the reforms demanded for the improvement of our current literature. Whether effected or not, the reviewer must do his duty, by condemning where condemnation is merited.

A Treatise on the Forces which produce the Organization of Plants. By J. W. Draper, M.D. New York. London, Wiley & Putnam.

THE phenomena connected with the processes of vegetation are so curiously complicated, and so singularly interesting in their beautiful developments, that they have naturally excited the attention of all observant and reflecting minds. The Botanist, the Physiologist, and the Chemist have therein found extensive scope for their inquiries and experiments; and almost every branch of Natural Philosophy has been brought to bear on the investigations which have been made into the causes operating in the production of the organization of plants. Still, however, considerable obscurity hangs over the question, which can only be cleared away by patient experiments and unwearied habits of observation.

Dr. Draper professes to explain many of the most remarkable phenomena connected with vegetation. This treatise is evidently the work of an industrious experimentalist, and the production of a comprehensive mind; and as such, it must be reviewed with respect. Many of the views, indeed, therein put forth are opposed to the received opinions of modern philosophers; but to this we are not at all disposed to object. We would, however, protest against the dogmatic style in which the author's doctrines are promulgated, and the constant arrogation of the discoveries and the ideas of other investigators to himself. The cause of Truth is materially

damaged by this; less reliance is placed on the author's investigations than they probably deserve. Hence even striking facts have to struggle against awakened prejudices; and thoughts and suggestions, valuable in themselves, are treated with undeserved contempt; unkindly feelings are generated, and the investigator of Nature, in consequence, rapidly degenerates, in his vain endeavour to support a false position, into a partizan. Having done our duty in pointing out this unfortunate mistake, to use no severer term, we proceed to the more agreeable task of examining the question under consideration,—and this we hope to do with fidelity and candour.

Dr. Draper, in the first place, ventures on the exploded speculation of some naturalists of the last century, who fancied that, under the influence of certain unknown "vital forces," inorganic matter was converted into an organic body; and he refers this change to the action of the solar rays. Although "the sun may breed maggots in a dead dog," it cannot now-a-days be admitted that either animal or vegetable life can be produced from pounded flints or fragments of marble. Indeed, the author himself at length, even against his own previous reasoning, appears to admit the necessity of an organized germ.

The influence of the sun's rays in the development of the conserve for their germs must be admitted; and the explanation given, referring their growth to the decomposition of the gaseous elements of water, is satisfactory. We cannot, however, say the same for the author's notices of the general processes of germination, although these are founded on his own experiments. The statement; that light—and that, too, to take the author's own ideas, light deprived of the principles of heat and chemical action—is beneficial to germination, is contrary to experience. Every one knows that the covering of the soil, insuring darkness, warmth, and moisture, are the essentials required. This is more strikingly shown in the process of malting than even in the natural condition; and it is only by the most scrupulous attention to these points that the required change can be produced in the seed. The question whether the luminous or the chemical rays are the most beneficial to the growth of plants, is still open for examination. Dr. Draper states positively, as the result of his inquiries, that the luminous rays alone act in producing the decomposition of carbonic acid by plants, and in forming the colouring matter of the leaves; whilst the chemical rays are active in producing motion—that is, that the bending of plants towards the light is due to their influence. Upon these points he is at issue with other investigators, who have stated the very reverse of these results. We hope that the question will be set at rest by some careful experiments on both these points. The circulatory system of plants is another point which is brought under consideration. The rise and fall of the sap, in obedience to laws regulated by the changes of the seasons, are phenomena upon which there has been much speculation, and some very good experiments. When we consider the force necessary to lift a column of water sixty or seventy feet, we shall perceive that no unimportant power is brought into action in raising the sap to the "topmost twig" of the tallest trees. Capillary attraction has been called in to aid the ascending current; but this, it has generally been admitted, is an inadequate power. Vital action—a term to which no very definite meaning can be attached—is brought to the aid of capillary attraction. With these powers several theoretical writers have been satisfied, and the world has rested somewhat contentedly with an explanation which it could not understand. It is not unfrequent that we are content to hide our ignorance under a sounding epithet. Dutrochet and Porret dis-

vered the p... in raising... recent inv... is not conf... porous bod... trical conc... and exosmo... with which... is exceedin... ciated with... inclined to... plants. T... ble expla... phenomena... power, exc... much of th... pears.

There are... by Dr. Dra... able. We... the endosm... capillary at... discuss this... remark, th... overflow, w... with the po... flow with g... One-third... voted to th... even of this... other portio... reprints of... by Dr. Dra... Institute, '... Philosophic... them, refer... and many o... ous informa... ters, howev... more than t...

The Cock... Dublin City... life again?"... as we made... but painful s... of the merit... novels. Th... entertainment... reader's hear... scenes of crim... as if with a p... How wrong i... sorts know... stand by, an... heroine as M... association w... give her over... and his dem... plainly as we... le!" The v... gross pursuit... Chancey, are... main incident... Mr. Bayes's... "surprise,"... touches of re... in the perso... Flora Guy, Dublin—but... the heroine fr... her deliveran... and fevered... home from se... "Lucretia Bo... piece of bedc... who have eve... cation of nov... the less acie... butterflies and... stars and stea... warning him... this being a t... life, let him t...

vered the peculiar power of organized diaphragms in raising water above its natural level. More recent investigations have shown that this power is not confined to organized tissue, but that any porous body, with its two sides in opposite electrical conditions, has the power of *endosmose* and *exosmose* to a remarkable extent. The force with which this principle will overcome resistance is exceedingly great. To this action, then, associated with capillary attraction, Dr. Draper is inclined to refer the rise of sap in the vessels of plants. This, indeed, seems to be the most probable explanation of the mechanical part of the phenomena; and with the assistance of electrical power, excited by the agency of solar radiations, much of the difficulty of the question disappears.

There are, however, many positions taken up by Dr. Draper which we consider to be untenable. We might instance his argument, that the endosmose action is only another form of capillary attraction. It would be out of place to discuss this question here; and we will merely remark, that no capillary tube is ever found to overflow, whereas the fluids in all arrangements with the porous diaphragms are found to overflow with great mechanical force.

One-third of the above volume alone is devoted to the subject indicated by its title; and even of this part, two-thirds are irrelevant. The other portion of the volume consists entirely of reprints of papers which have been published by Dr. Draper in the 'Journal of the Franklin Institute,' and in the 'London and Edinburgh Philosophical Magazine.' These have, most of them, reference to the chemical action of light; and many of them certainly contain much curious information. Their purely scientific character, however, renders it impossible for us to do more than thus refer to them.

OUR LIBRARY TABLE.

The Cock and Anchor: being a Chronicle of Old Dublin City, 3 vols.—"Are the O'Harras come to life again?" was the question which suggested itself, as we made our way through the pages of this forcible but painful story. 'The Cock and Anchor' has many of the merits and all the blemishes of Mr. Banim's novels. The tale-teller, at an early stage of the entertainment, gets a fierce and firm grasp upon the reader's heart-strings—and seems to lead him through scenes of crime, misery, and passion; one after another, as if with a perverse desire to shock and to give pain. How wrong it is thus to abuse power, legislators of all sorts know—and we, as literary policemen, cannot stand by, and see such a gentle and unoffending heroine as Mary Ashwood tormented and sullied by association with her father and her brother, who give her over to the tender mercies of a bully-suitor and his demoniacal familiar—without saying, as plainly as words can speak, "Such things should not be!" The very skill with which Nicholas Barden's gross pursuit, and the desperate villainy of Gordon Chancey, are wrought up, doubles their offence, as main incidents in a work of fiction. Here (to adopt Mr. Bayes's much-lauded-at standard) it is all "surprise," and no "elevation." It is true that some touches of redemption are administered to the story in the person of gallant O'Connor, the lover, and Plum Guy, the girl from the vile public-house in Dublin—but the one is made powerless to rescue the heroine from degradation—and the other manages her deliverance too late. We close the book, pained and fevered: with the sort of feeling which we bring home from seeing a representation of Victor Hugo's 'Lucrèce Borgia' or that still more highly-spiced piece of bedevilment the 'Tour de Nesle.' By those who have ever troubled themselves with the classification of novels—few more words will be required; the less scientific reader (for there is a science of butterflies and of flowers—and of novels, as well as of steam and steam-engines) may, possibly, thank us for warning him not to expect any pictures of manners; this being a tale of passion. If he wants old Dublin life, let him turn back to Lady Morgan's 'O'Briens'

—if the Irishman, let him once more make acquaintance with Miss Edgeworth's Sir Condy Rackrent, or Lanty, the post-boy, with his never-to-be-forgotten letter, closing her brilliant 'Absentee' with a true *trost for the avenue*. At all events, he will find no such scenes and persons in 'The Cock and Anchor'—though we may be able to discern indications of skill to produce such in the author, when he shall see fit to exchange the spasms and wailings of melodrama, for the humours of men and women.

The Smuggler, by G. P. R. James, Esq., 3 vols.—A reader innocent of Fiction,—could such a phenomenon be found, even in the Society of Friends,—would, possibly, pronounce this 'Smuggler' the beau ideal of a novel: with its sentimental and its saucy heroine,—its village maiden, Kate Clare, "done to death" by the vengeance of a village villain—its troop of bold contrabandists, whose feats almost elevate "the landing of a cargo" into a piece of choice strategy—its *père noble* (as the French have it) weighed down by the remembrance of crime committed long ago with his eccentric miser-brother, who keeps aloof at the right time, and at the right time throws about his gold in sackfuls:—and its scheming Machiavel, who contrives to hold the aforesaid remorse-stricken gentleman under the screw by possessing his secret and pressing it home at the proper moment. Then, what so terrible as a daughter forced towards a marriage she abhors by threats against her father's life? What so breathless as the suspense, when once the novelist (like sister Anne in 'Bluebeard') has dropped a word of "people galloping" towards the prison, to rescue the nymph from her duresse? Old as we are, and versed in the novels of Walter, Theodore, Edward, and James—(to say nothing of a hundred moving fictions by Ellens, Marys, and the like) we confess to having been made uneasy by this same 'Smuggler'; so clever is the handicraft with which the familiar stock of "accidents and offences" is compounded. Neither to those who require something more of moral and meaning in a work than is comprehend in the threadbare phrase "poetical justice," will the novel be wholly disappointing. The picture of a state of society, in which a large body of country gentlemen countenanced and screened some of the most reckless and demoralized of their species, is one to make the social philosopher think, and thence deduce..... we will leave his deductions to the politician. More within our sphere of observation is the fact, that, with all Mr. James's wondrous facility (in which he runs a neck-and-neck race with Mrs. Gore) he preserves so meritoriously that power of clear writing and pleasant scene-painting, which gives his writings an intelligibility too rare in these days; and may be one reason why they are so largely read in foreign countries.

The Trapper's Bride, a Tale of the Rocky Mountains; with the Rose of Ouisconsin: Indian Tales, by Percy B. St. John.—The Indians are a little "worn out" as subjects for romance. Mr. Catlin's pictures and narratives—the real presence of Tobacco, Driving Cloud & Co. at the Egyptian Hall, and the real marriage, with its explanations, which ended their London residence, have at once righted and wronged the red men, by giving us clear idens in place of picturesque impressions. We have little disposition to look further for our heroes and heroines among "the wild Comanches, among the Mandans, the Sioux, the Seminoles, and other famous tribes of the New World,"—promised to us as matters for future fiction in Mr. Percy St. John's advertisement. The Chinese, we think, ought now "to have the call," or the Kabyles; and we wonder, by the way, that so few among the French novelists, always on the *qui vive* for a costume or a sensation, have availed themselves of the fruits of their own conquest. But for this ebbing of the public taste, Mr. Percy St. John's Indian Tales might have travelled wide. He writes like one who knows his personages and his scenery; works up an escape or a moment of suspense with a forcible hand; and manages his dialogue well, without cloying the reader by the superabundant tropes and figures to which the generality of those "laying hands on the Indians" are liable.

Collection of Examples in Pure and Mixed Mathematics, with Hints and Answers, by A. Wrigley, M.A. and W. H. Johnstone, M.A.—A very promising work. The subjects are arithmetic, algebra, trigonometry, geometry, &c., and statics and dynamics so

far as the methods are independent of the differential calculus. The few words of hint added to many of the mechanical questions are likely to be very useful to the unassisted learner. If this work, as it ought to do, should see a second edition, we should recommend that the numbering of the questions should be carried right through all the subjects.

Guide to Photography, by W. H. Thornthwaite.—This little work comprehends directions for all the best photographic processes, including the Daguerriotype, Calotype, Chrysotype, Cyanotype and Energiatype. The notice of Optics, which is given with a view to render all persons familiar with the principles upon which the formation of lenticular images in the camera depends, is exceedingly good. The author states, that "The simplest branch of photography appears to have been first suggested by Sir H. Davy." This is not exactly correct. Mr. Wedgwood, after having pursued the subject for some time, and obtained many good results, both on paper and on leather, submitted his process to Davy, previously to its publication in the Journal of the Royal Institution, when this distinguished chemist tried some experiments, and added a few notes to Mr. Wedgwood's paper. The processes are for the most part accurately given, and we can recommend this 'Guide' as a useful handbook to the amateur photographer.

Sketches and Specimens from the Minor Poems of Schiller, by G. C. Swayne.—An enthusiastic admirer of "the Teutonic Man" and his literature, Mr. Swayne brings both taste and learning to the task of translation. With a deep feeling for the beautiful, and a passion for its subjective and poetic forms, he finds in Schiller a mind harmonizing with his own. Hel enters into his spirituality, his heroism, his idea progress, and in all shows a corresponding knowledge. In his remarks on Schiller's 'Der Tanz,' he indicates an imagination so kindred to the original poet's, that we regret he has not attempted a version of that singular lyric. But that we have so lately had to deal with translations from Schiller's minor poems, we should have been eager to quote from the 'Sketches and Specimens' before us. We must now be contented with simply reporting that they are well done.

LIST OF NEW BOOKS.

Adair's (Rt. Hon. Sir Robert, G. C. B.) Negotiations for the Peace of the Dardanelles, 1809-10, 2 vols. 8vo. 12. 4s. cl.
Addison's (C. G. Esq.) Treatise on the Law of Contracts and Parties to Actions ex contractu, Part I. royal 8vo. 14s. 6d.
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FOREIGN CORRESPONDENCE.

Treves, May, 1845.

Spite of anything I have read or heard, I cannot help doubting whether there really be in all Europe two hundred consecutive miles of such hideous country as those lying between Paris and Metz. From the time you pass the Porte St. Martin till you begin to descend into the valley of the Moselle—within half an hour's drive of Metz—there is a uniformity of ugliness such as Nature herself, in her dullest or most spiteful moods, never created. Let the English eye, pampered on scenes of beauty, and accustomed to regard the Newmarket road as the *ne plus ultra* of dreary monotony, come and regain its tone here. I remember hearing the poet Southey say, that Newmarket heath had something of the sublimity of the sea. Without going that length, one may say that every landscape composed of unbroken horizontal lines has somewhat of the character of boundless expanse, which is one of the grandeurs of the ocean. A very striking example of this may be seen in Calcott's beautiful little picture of the 'Campagna di Roma,' than which I have seen very few that act more strongly on the imagination. But intersect such a country with a straight road, and cut it up into an infinite succession of square patches, unvaried by objects of any other form, and the effect on the eye becomes indescribably painful. You cannot compare this part of France to the dreariest part of Cambridgeshire; for Cambridgeshire, like every other part of England, is studded with those isolated dwellings which, whether great or small, rich or poor, break the monotony of a flat country to the eye, and the dreariness of it to the imagination. But through the whole extent of rich and prosperous Champagne you never see such a thing as a homestead—that centre around which in England objects so dear to the eye of the painter and the heart of the poet are sure, in more or less beauty and abundance, to be clustered;—the hay-stacks, generally shaded by a few large trees; the castle; the pond, with its animal and vegetable ornaments; the carts and waggon, picturesquely grouped; the garden, with all its brilliancy and all its promise. But in this part of France, where the *routinier* character of the peasantry has not yet broken through the habit of congregating in villages for the mutual protection and defence once so necessary, those single homes which testify to the long security of England are nowhere to be seen. The villages are mere rows of houses by the roadside, without any rural accessories, and without any attempt at ornament.

So much for the disadvantages of Champagne. A very little inquiry, however, suffices to shew the vast solid advantages which lie in the opposite scale. Poverty—meaning by that word want of food and of the means of earning food—seem to be wholly unknown here; indeed, they say the population is rather defective than the contrary, and that there is a difficulty in obtaining hands. Nearly all the peasantry are proprietors; and as their families are universally small, they find sufficient employment on their own land, and in their own houses. The ugliness of the country is not more striking than the good looks of the people. I saw more handsome well grown men and women in three days in Champagne, than you could see in as many months in Paris. Their manner of saluting each other is frank, cheerful, and good-humoured, and they seemed to me to be generally civil to strangers. I saw not a single beggar up to Verdun, where there were three or four aged professional beggars about the inn door. I must add, that I saw not a single person who might claim to be distinguished as a gentleman, nor any house, carriage, or other appurtenance, seeming to belong to a person of that class, except in the large towns. It is for you to make up your mind whether you like this state of society or not. I am not going to volunteer any aid of mine in a matter which rests on so wide a basis of tastes and opinions, and on which (according to my own) there is, as dear Sir Roger (himself the most exquisite model of country gentlemen) would say, "so much to be said on both sides." All I can do for you is to try to set before you a faint sketch of the appearances which present themselves to the traveller, and which often suggest such long trains of reflection on the various lots in which good and evil are bound up together here below.

We met several large parties of German emigrants; whole families of decent looking peasants in huge covered waggons like travelling booths. By the side walked some of the sturdier and more active. One group of three fine young women, walking hand in hand in the *herzlish* German fashion, struck me much by the contrast of their innocent candid faces with the keen man-of-business expression of the French peasant women. These seemed to regard the wanderers with contemptuous pity, mixed with wonder that anybody will consent, on any terms, to emigrate. It is, perhaps, a cheat of the imagination, to put any earthly good in comparison with independence and security; yet I must confess that when I thought of the comforts, and pleasures, and refinements, and elegancies—I use the words advisedly—of an English labourer's cottage, such as I remember, and compared it with the utter negative of everything that betokens the feeling of beauty, the sentiment of order,—or the satisfaction arising from cleanliness, which the habitations of the peasantry of this region display, I was not sure that the balance of enjoyment was so clearly on the side of the man who is insensible to these pleasures of taste, even though he tills his own field, and has always, as we were told, "de l'argent dans son armoire." You cannot imagine that I mean that any condition is so bad as that of a man who is in constant anxiety as to the bare means of appeasing hunger, or whose hunger is hardly ever thoroughly appeased. In such a condition, not only the possession, but the sense of any of the embellishments of life is impossible. But though bread is necessary to the support of man's life, he lives not on bread alone; and I cannot help doubting whether (supposing an English labourer to be tolerably secure of moderate wages) he would be much the gainer in happiness if he were transplanted from the well washed and sanded floor, the snow white table, the few brilliant utensils of metal, the "broken tea-cups nicely ranged for show," the bit of garden neatly paved in and filled with gay flowers, to which he has been accustomed, to the dirty and offensive though solid dwelling, where the eye can find no single object to delight in (except indeed the *armoire* containing the *écus*), and around which is nothing but nakedness or filth, even though the field he tills was his own. If you say, he would dig his garden, and his wife would clean and brighten his cottage, I reply, you are altering the conditions of the exchange. Nothing is more curious among national characteristics than the modes in which the æsthetic feeling manifests itself. It has been the fashion to deny it altogether to the English people, and it is certain that they have not the taste in dress of the French, nor in matters of mere show their decorative talent, nor the musical refinement of the Germans. But I am ready to maintain that no people in the world is so industrious, or so successful in surrounding everyday life with objects which satisfy the yearning for Beauty which lies in the heart of man, as the English. The peculiarity is, just that it is on his everyday and home life, and not on occasions of show or festivity, that the Englishman bestows his taste and care. It is out of the commonest and humblest materials that he extracts beauty;—above all, the unerring instinct of utility and fitness never deserts him, and it is with the house that gives him shelter, the utensils that he daily uses, the garden that supplies him in part with food, that he combines a picture, the grace and charm of which nobody can fully understand who has not studied the unsightly, the incongruous, the ill-adapted objects in the midst of which the people of most other countries are contented to pass their daily lives. Generally speaking, the noble works of high art that Germany produces, or the wonderful works of elegance and prettiness that distinguish France, are the results of careful study and culture. They are the work of *des hommes spéciaux*; whereas this purely English art of embellishing Home is the effect of the instinct which urges the untalented man to seek and to find the union of the Fair with the Useful.

Chalons is a pretty little town enough; contains two interesting churches, and, as a Frenchman told me, "la plus belle préfecture de la France," a great deal too "belle" indeed, and quite disproportioned to the place. The Romanesque Church of Notre Dame is very striking. Still more so, is that admirable little gem of florid Gothic, Notre Dame de

l'Épine, about two leagues on the road to Metz. The exterior is especially beautiful; full of bold and quaint and graceful devices, executed with a masterly hand; "the whole," said a companion, "more like some luxuriant tropical plant than a mass of stone."

Metz Cathedral is a very shapeless, ill-proportioned mass on the outside. The inside is magnificent in proportion and in colour; the yellow sand-stone, bistered in parts by time, lights up with a gorgeous and harmonious warmth through the richly-light windows. The late bishop put in a new one, painted at Metz, an imitation of the votive windows, formerly so common; containing the portrait of the donor, kneeling before his patron saint. It is a good deal to say that it does not appear utterly contemptible by the side of the exquisite works of Anton Busch. I went into the shop of a *bookiniste* close to the Cathedral, and found there a pleasing little Parisienne, whom cruel fate had placed at Metz. As most Frenchmen, and all French women, speak of provincial life as a sort of limbo, I do not generally pay much attention to their complaints; but when she said of these people, "Même quand ils sont bons ils ne sont pas obligeans," I could not help silently and reluctantly admitting that this is, to a great extent, true of the German race. Perhaps they will retort, and say of the Parisians, "Même quand ils sont obligeans ils ne sont pas bons." However, that *bonté* is to be found at Paris, and *obligeance* all over Germany, I can testify.

In short, as one lives on, all one's generalizations fade away, or are wonderfully diminished in extent. I have just parted for ever from a very favourite one, which a week ago I could have defended at the point of the pen against all gainsayers,—I firmly believed from past experience that all Prussian custom-house officers were intelligent and civil. The entrance into the Prussian territory at the village of Perl, on the Moselle, was, however, destined to destroy this agreeable illusion. After a scene of burlesque airs of solemn authority and heroic obedience to duty, of pedantic vexatious minuteness, and of a compound hard to discriminate of genuine confusion of head and bad faith, these zealous functionaries succeeded in capturing, out of five boxes, one pair of new ladies' boots, laid on the very top (a proof, as they affirmed, of intention to defraud), and a small pot of bear's grease, the whole bringing to the royal revenue a few groschen, retarding the steamer at least an hour, and worrying innocent and loyal travellers, who were astonished to find themselves treated, for the first time in their lives, as smugglers, upon such proofs as the foregoing. On the frontiers of some countries (which shall be nameless) this incident would be hardly worth recording, but it is so unlike all my former experience of Prussia, that I give it a place among the memorabilia of this journey. N.B. The chief actor could not speak or understand French. Now, though I am far from acceding to the French pretension that the world is bound to talk their language, and they to talk none but their own, yet I do admit that, on this frontier, a douanier would not be the worse for understanding the language of the *limitrophe* country.

It is perhaps intended as an *aviso* to the French, as to the universality of "la langue universelle." At table d'hôte, at Metz even, German was the prevailing language, and here, in the principal inn of this frontier city, the chambermaids and some of the men-servants do not understand a word of French. "Imaginez," said a Parisienne, "on a envoyé (on some political mission) un homme si bête qu'il ne parle pas même le Français." "C'est une chose qui s'est vue bien souvent chez nous, Madame," replied the English lady to whom she spoke. "On nous a envoyé des hommes si bêtes qu'ils ne savent pas même parler l'Anglois." You cannot imagine how shocked she looked at this impudent assumption of equality. But reasonable men in France are beginning to see that such equality must be admitted, and that the most truly enlightened patriots are those who admit it with the best grace. The full and accurate appreciation of the merits (and demerits) of other countries; the intimate and delicate knowledge of the peculiarities of their language, literature, character, and habits of thought, is a very characteristic trait of the great man at the head of affairs. It is, I fear, about the least likely to render him popular, but

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it renders him of infinite value to all Europe, and to the great common cause of civilization.

I shall not trouble you with descriptions of Treves, which you may find in Mr. Murray's inevitable Hand-Book; and *passim*. If you have a mind for quiet comfortable quarters in a most curious and interesting old house, in a charming country, full of remains of every stratum of civilization from the Roman times till now, I recommend you to go to the Rothe Haus (*vide* Murray), where everybody is civil, down to the tame stag and two little roes I have been playing with in the ancient court-yard, and where you are really at your ease in your inn. Already we feel that we have exchanged French familiarity, which, though sometimes most agreeable and engaging, is very often impudent and aggressive, for that of Germany, which is generally naïve and confiding, and sometimes, indeed, coarse. The chambermaid made an earnest and cordial appeal to my sympathy, with her anxiety about the weather for the "schwere Wasche," which is in hand to-day; and the waiter inquired of my companion, how *Kellners* fared and were treated in England, whither he is going to seek his fortune, a kind of information we were sorry not to be able to give. The sun shines on the washing day, to my great satisfaction; I hope my Vaterland will not be less propitious to the civil Kellner.

I once met with a specimen of this *zutraulichkeit*—this confiding familiarity—on the part of a waiter, which I shall never forget. It was in Saxon Switzerland. We had climbed the Grosse Winterberg, and were tired and hungry. But the waiter's ardour for learning English was not to be controlled. He asked us the name of everything he brought; and every minute interrupted our eating with the question, "If gentlemen say me (so and so), what I will say?" The perseverance and ingenuity with which he contrived to convert our dinner into an *Englische stunde*, was irresistible. He brought me a copy-book, in which he had got travellers to write words and sentences, and begged me to contribute. I never could imagine what to write in an album, and inflexibly refuse if I am asked, but here I was in my *métier*, and gave the good-natured waiter some specimens of translation, with which I was, for once in my life, satisfied.

A tanner, digging a pit for his trade a few days ago, came upon a fine piece of mosaic. We went to see it, but unluckily the earth had fallen in over it, and covered it all. Nothing more can be done without leave from the king, who very properly keeps a strict watch over all such discoveries. What the Prussian government has done here in the way of quiet, intelligent research, cannot be too highly admired or praised. Up to the year 1818, a great, and by far the most interesting, part of these magnificent Roman remains were completely buried. The work of excavation is steadily proceeding, and the great Palace, commonly called the Baths, but of which the Baths form but a small part, is a mine which promises rich results.

P.S. The only undisputed *puissance* in Europe is, as far as I can find, Mr. Murray. Will you tell him that he, like all great potentates, must award praise and blame with caution, and only on ample evidence? To get into the "Englische Reisebuch" is at least equal to a peerage. The greatest forbearance one can practise is not to boast of some connexion or acquaintance with that sovereign arbiter of inns.

FIFTEENTH MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

CAMBRIDGE, JUNE 18.

[From our own Correspondents.]

GENERAL COMMITTEE.

THE Committee met in the Town Hall of Cambridge, on Wednesday, at two o'clock, the Dean of Ely in the chair, when the minutes of the last two meetings were read by Professor Phillips, and confirmed.

Colonel Sabine then read the Report of the Council. The Report first alluded to the Resolution passed by the General Committee assembled at York, to the effect that "the Council be authorized to invite, in the name of the Association, the attendance of Messrs. Humboldt, Gauss, Weber, Kupffer, Arago,

Plana, Hansteen, Kreil, Lamont, Boguslawski, Dove, Kämtz, Bache, Gilliss, Quetelet, Hermann, and other distinguished foreigners who have taken a leading part in the great combined system of Magnetical and Meteorological Observations which are now in progress, at the next meeting of the Association at Cambridge, with a view to a conference on the expediency of continuing the observations for another triennial or longer period, and for the adoption of such measures with respect to the observations which have been, or may hereafter be made, as they may deem best calculated to promote the advancement of these branches of science." In conformity with this Resolution, a circular had been addressed by the President to the gentlemen named in the Resolution, and to other distinguished foreign cultivators of the sciences of magnetism and meteorology, and the following gentlemen had signified their intention of being present at Cambridge to attend the proposed conference:—

The Baron von Senftenberg.
Professor Boguslawski, of Breslau.
Professor Dove, of Berlin.
Professor Adolphe Hermann, of Berlin.
Professor Kreil, of Prague.
M. Kupffer, Director-General of the Magnetic and Meteorological Observatories in Russia.

Other gentlemen to whom the circular had been sent, and who were prevented from personally assisting at the conference, had addressed letters to the Committee, conveying their opinions on points which appeared likely to come under discussion. The Council had printed these letters, and copies had been distributed to the members of the General Committee. The Council considered it a proper compliment to gentlemen who, at the request of the Association, had travelled from distant countries to take part in the proposed proceedings, to elect them corresponding members of the Association—and had directed that each of these gentlemen should be presented on his arrival at Cambridge with a complete set of the publications of the Association. The Report then referred to the proposed modification of the laws regulating the terms of admission, which we printed last week—and to the resolution of the General Committee, that it be referred to the Council to consider of the propriety of modifying the title and regulations of Section E.; so that it might include a more general range of subjects, and to report on the best means of carrying that modification into effect. In furtherance of this resolution, the Council had caused copies of a report which they had received from Dr. Hodgkin to be forwarded to the former Presidents of Section E., and other members of the medical profession, with a request that any gentleman inclined to favour the Council with their opinions on the subject, would do so before the 10th of June. Two letters had been received, one from Dr. Roget and one from Dr. Williams, and copies of these letters, with Dr. Hodgkin's Report, had been furnished to all members of the General Committee. The Council had also taken into consideration the suggestion made by the General Committee at York, relative to the transmission of scientific periodicals between this and foreign countries; but they had not been able to satisfy themselves as to any practical remedy, and had not therefore thought it expedient to make an application to Government. The General Committee having also placed at the disposal of the Council the sum of 150*l.* for the maintenance of the Kew Observatory, the Council reported that of this sum, 149*l.* 15*s.* had been expended. The General Committee having also placed the sum of 30*l.* at the disposal of the Council, for the purpose of procuring M. Kreil's self-registering barometer, thermometer, and hygrometer—the Council announced that these instruments had been procured at the cost of 25*l.*, and been placed under Mr. Ronald's care at the Observatory at Kew. The Report also stated that the town of Southampton had, by a deputation, renewed their invitation to the Association to hold their next meeting at that town—and that letters had also been received from Dr. Conolly, chairman of a provisional committee, and from Dr. Thorp, president of the Literary and Philosophical Society of Cheltenham; intimating an intention of some of the most influential residents of that town, as well as of the county of Gloucester, of sending a deputation to Cambridge, for the purpose of inviting the Association to hold their meeting for 1846, at Cheltenham.

The reception of the Report was moved by Mr. Greenough, and seconded by Professor Henslow, and passed unanimously. The new regulations respecting the admission of members, which we published last week, [*ante*, p. 589] were, with some verbal alterations, agreed to.

Sir J. HENSCHEL then addressed the meeting, and said that the preliminary arrangements for the Magnetic Conference having been already mentioned in the Report of the Council, he should only impress the importance of the full discussion of a subject which involved an appeal to our own and to foreign governments to continue expensive observations and surveys, which might extend over several years. He should, therefore, propose that those members of the Association who had paid marked attention to the sciences of magnetism and meteorology should be invited to share in the discussion with the foreign members, and that the members of the Committee of Recommendations be requested to favour the conference with their attendance. He then moved that the following gentlemen be requested to join the conference, viz. Mr. J. Phillips, Sir T. Brisbane, Mr. Brown, Mr. Fox, Professor Forbes, Mr. Riddle, Sir J. Clark Ross, Mr. Snow Harris, Dr. Scoresby, and Mr. Lawson. The motion passed unanimously.

The Treasurer's Report was then read by Mr. John Taylor.

THE GENERAL TREASURER'S ACCOUNT.

From the 26th of September 1844, to the 19th of June 1845.

RECEIPTS.

	£.	s.	d.
Life Contributions received at the York Meeting and since	781	0	0
Annual Subscriptions ditto	452	2	0
Ladies' Tickets .. ditto	360	0	0
Section Tickets .. ditto	1	0	0
Minors' Tickets .. ditto	8	0	0
Received Composition for Books (future publications)	164	0	0
Ditto Dividend on £5500 in the 3 per cent. Consols, six months, to January 1845 (less Income Tax)	80	1	11
Received from sale of Reports, viz.			
Volume 1st	2	11	3
" 2nd	3	0	0
" 3rd	4	13	0
" 4th	3	15	8
" 5th	3	8	0
" 6th	6	15	4
" 7th	7	1	0
" 8th	7	13	0
" 9th	12	3	0
" 10th	9	11	8
" 11th	13	11	3
" 12th	47	13	10
" 13th	9	6	8
Lithographs	1	13	0
Dublin Communications	0	2	0
	132	18	8
Balance carried down	360	10	5
	£2239	13	0

PAYMENTS.

	£.	s.	d.
Balance due on the General Account, brought on	478	1	5
Sundry Disbursements by Treasurer and Local Treasurers, including the Expenses of the Meeting at York, Advertising, and sundry Printing	286	12	10
Printing, &c. of the 13th Report (12th Vol.)	37	13	6
Engraving, &c. for the 14th ditto (13th Vol.)	70	15	6
Salaries to Assistant General Secretary, Accountant, &c.	175	0	0
Paid to Committees on account of Grants for Scientific purposes, viz.—for			
British Association Catalogue of £. s. d.			
Stars	351	14	6
Meteorological Observations at Inverness	30	18	11
Magnetic and Meteorological co-operation	16	16	8
Meteorological Instruments at Edinburgh	18	11	9
Reduction of Anemometrical Observations at Plymouth	25	0	0
Electrical Experiments at Kew Observatory	43	17	8
Maintaining the Establishment at ditto	149	15	0
For Kreil's Barometerograph	25	0	0
Gases from Iron Furnaces	20	0	0
Experiments on the Actinograph	15	0	0
Microscopic Structure of Shells	20	0	0
Exotic Anopleura	10	0	0
Vitality of Seeds { 2 0 7—1843 }	9	0	7
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Marine Zoology of Cornwall	10	0	0
Physiological Action of Medicines	20	0	0
Statistics of Mortality in York	20	0	0
Registration of Earthquake Shocks, 1843	15	14	8
	831	9	9
	£2239	13	0

On Account of Printing of Lalande and Lacaille's Catalogue of Stars.

Balance of the Grant from Her Majesty's Government, brought on from last Account	£ 934	2	0
Paid on account of Printing, &c. since last Meeting	300	0	0
Balance	634	2	0
	£ 934	2	0

The following is a List of the Officers and Council for the present Session:—

*Trustees (Permanent).—*Roderick Impey Murchison, Esq., F.R.S.; John Taylor, Esq., F.R.S., Treas. G.S.; the Very Rev. the Dean of Ely, F.R.S. *Vice-Presidents.*—The Earl of Hardwicke; the Bishop of Norwich, Pres. L.S.; the Rev. John Graham, D.D.; the Rev. Gilbert Ainslie, D.D.; the Rev. Prof. Sedgwick, F.R.S.; G. B. Airy, Esq., F.R.S. *General Secretaries.*—Roderick Impey Murchison, Esq., F.R.S., London; Lieut.-Col. Sabine, F.R.S., Woolwich. *Assistant General Secretary.*—Prof. Phillips, F.R.S., York. *General Treasurer.*—John Taylor, Esq., F.R.S., 2, Duke-street, Adelphi, London. *Secretary for the Cambridge Meeting in 1845.*—Wm. Hopkins, Esq., F.R.S.; Prof. Ansted, F.R.S. *Treasurer to the Meeting in 1845.*—C. C. Babington, Esq., F.R.S. *Council.*—Sir H. T. De la Beche; Rev. Dr. Buckland; Dr. Daubeny; Prof. E. Forbes; Prof. T. Graham; W. S. Harris, Esq.; James Heywood, Esq.; Dr. Hodgkin; Eaton Hodgkinson, Esq.; Leonard Horner, Esq.; Robert Hutton, Esq.; Sir Charles Lemon, Bart.; Charles Lyell, Esq.; Prof. Mac Culloch; the Marquis of Northampton; Prof. Owen; Rev. Dr. Robinson; Captain Sir James Ross, R.N.; the Earl of Rosse; H. E. Strickland, Esq.; Lieut.-Col. Sykes; William Thompson, Esq.; H. Warburton, Esq.; Prof. Wheatstone; C. J. H. Williams, M.D. *Local Treasurers.*—Dr. Daubeny, Oxford; C. C. Babington, Esq., Cambridge; J. H. Orpen, Esq., Dublin; Charles Forbes, Esq., Edinburgh; Prof. Ramsay, Glasgow; William Gray, Jun., Esq., York; William Saunders, Esq., Bristol; Samuel Turner, Esq., Liverpool; G. W. Ormerod, Esq., Manchester; James Russell, Esq., Birmingham; William Hutton, Esq., Newcastle-on-Tyne; Henry Woolcombe, Esq., Plymouth; James Roche, Esq., Cork. *Authors.*—Robert Hutton, Esq.; Leonard Horner, Esq.; Lieut.-Col. Sykes.

Mr. Murchison then read lists of officers of different sections, and announced that the following gentlemen would constitute the Committee of Recommendations:—The Officers of the Association, Professor Graham, Mr. Hopkins, Dr. Hodgkin, Mr. Hutton, Mr. Lyell, Sir Charles Lemon, the Marquis of Northampton, the Earl of Rosse, Mr. G. Rennie, Colonel Sykes, Mr. H. E. Strickland, Mr. Thompson, the Earl of Burlington, Sir D. Brewster, the Earl Fitzwilliam, Professor J. Forbes, Professor Henslow, Dr. Haviland, Rev. W. Vernon Harcourt, Mr. James Heywood, Mr. Leonard Horner, Professor Lloyd, and the Dean of Ely.

It was resolved, that the question of altering the constitution of the Medical Section, and the printed correspondence relating to the subject, which had been laid on the table, should be referred to the committee of that section to report thereon to the Council.

Sir J. Herschel announced that the Magnetic Conference would assemble, for the first time, on Friday morning, at eight o'clock.

The places of meeting are, for
London Council The Town Hall.
Committee of Recommendations
General Committee
Evening Meetings In the Senate House.

SECTIONS.	PLACES OF MEETING.
A. Mathematical and Physical Science	Union Room, Jesus-lane.
B. Chemistry	Lecture Room, Botanic Garden.
C. Geology and Physical Geography	Senate House.
D. Zoology and Botany	Philosophical Society's House.
E. Medical Science	Anatomical Lecture Room.
F. Statistics	Lecture Room in the Great Court, Trinity College.
G. Mechanics	Lecture Room under the Public Library.
The Model Room is at	Perse-School, Free-School Lane.

The following is a list of the Officers of the Sections:—

SECTION A.—Mathematical and Physical Science.

President.—G. B. Airy, F.R.S. Astronomer Royal.
Vice-Presidents.—Sir D. Brewster; the Dean of Ely; Sir T. Brisbane; Professor Challis; Professor J. Forbes; Sir W. R. Hamilton.
Secretaries.—Rev. H. Goodwin; Professor Stevelly; G. G. Stokes, Esq.
Committee.—The Earl of Burlington; J. A. Brown; G. Doland; M. Dove; Rev. S. Earnshaw; R. L. Ellis; M. Ermann; Colonel Everest; Professor Foggi; Dr. Green; W. S. Harris; Sir J. F. W. Herschel, Bart.; W. Hopkins; E. Hodgkinson; Dr. Hunt, Esq.; Capt. Johnston; M. Krell; M. Kupffer; Henry Lawson; Dr. Lee; Rev. Dr. Lloyd; the Master of Christ's College; the Master of Pembroke College; Professor Miller; Professor Phillips; Professor Powell; Rev. J. Power; Sir J. C. Ross; J. Scott Russell;

Colonel Sabine; Rev. W. Scoresby; Baron Stenfort; Lieut. Stratford; J. J. Sylvester, Esq.; Professor Thomson; Professor Wheatstone; Professor Willis.

SECTION B.—Chemical Science, including its application to Agriculture and the Arts.

President.—Rev. Professor Cumming.
Vice-Presidents.—Dr. Daubeny; M. Faraday; Professor Graham; Rev. W. Vernon Harcourt; Professor Miller.
Secretaries.—R. Hunt; J. P. Joule; Dr. Miller; E. Solly.
Committee.—Professor Schönbein; M. Boutigny; W. Armstrong; P. Clare; W. Francis; Dr. Fowkes; Professor Grove; Captain Ibbotson; W. Lucas; Dr. Leeson; C. Oakes; T. J. Peersall; Dr. Percy; Dr. Playfair; W. Sharp; C. W. Walker; R. Warrington; J. T. Way.

SECTION C.—Geology and Physical Geography.

President.—Rev. Professor Sedgwick.
Vice-Presidents.—Rev. W. Buckland; the Earl of Enniskillen; L. Horner; W. J. Hamilton.
Secretaries.—Rev. J. Cumming; A. C. Ramsay; Rev. W. Thorp.
Committee.—Baron Von Buch; Baron Von Waltershausen; of Göttingen; R. C. Austen; Professor Ansted; C. Bunbury; Sir H. De la Beche; Captain Sir E. Back; S. Clarke; Dr. Dieffenbach; Sir Ph. de Grey Egerton, Bart.; Dr. Falconer; Sir C. Fellows; Professor E. Forbes; Professor J. G. Fisher; Dr. Flitton; G. B. Greenough; R. Griffith; R. Hutton; W. Hopkins; Captain Ibbotson; C. Lyell; Sir C. Lemon, Bart.; H. L. Lindsay; R. I. Murchison; Lord Northampton; Professor Oldham; Professor Owen; Professor Phillips; H. E. Strickland; the Dean of Westminster.

SECTION D.—Zoology and Botany.

President.—Rev. Professor Henslow.
Vice-Presidents.—Bishop of Norwich; Professor E. Forbes; C. C. Babington; Rev. L. Jenyns; W. Ogilby.
Secretaries.—E. Lankester; T. V. Wollaston.
Committee.—Professor Allman; R. Ball; Professor T. Bell; G. Busk; Dr. Burchell; Dr. Carpenter; W. Clear; Dr. Daubeny; Dr. Dieffenbach; Dr. Falconer; Dr. Fleming; J. E. Gray; Captain Grover; Dr. Hodgkin; Dr. Hoeg; J. Hoeg; F. W. Hope; Dr. King; Dr. R. Latham; M. Lelys de Loy-champs; R. Mac Andrew; Dr. Macdonald; Admiral Sir C. Malcolm; A. Nasmyth; Professor R. Owen; Rev. J. Pollexton; Dr. Prichard; Rev. J. B. Reade; Dr. Richardson; Professor Royle; Sir R. Schomburgk; P. Selby; W. Spence; R. Taylor; W. Thompson; J. O. Westwood; J. Winterbottom; W. Yarrell.

SECTION E.—Medical Science.

President.—J. Haviland, M.D.
Vice-Presidents.—Professor Clarke; Professor Fisher; Dr. Hodgkin; Dr. Latham.
Secretaries.—R. Sargent; Dr. Webster.
Committee.—Dr. Budd; H. Croftfoot; Dr. Daubeny; Dr. Dieffenbach; Dr. Fowler; G. M. Humphrey; W. D. Husband; Dr. King; Dr. Laycock; Charles Letourgeon; Dr. Leeson; Dr. Merriman; Dr. Macdonald; Dr. Paget; Dr. Thackeray; Dr. Thurnall; Dr. Twining.

SECTION F.—Statistics.

President.—Earl Fitzwilliam.
Vice-Presidents.—Lord Salmon; Colonel Sykes; Sir C. Lemon, Bart.; Professor Pryme.
Secretaries.—J. Fletcher, Esq.; Dr. Cooke Taylor.
Committee.—Sir J. Boileau; Colonel Everest; His Excellency Edward Everett; J. Heywood; E. Hodgkinson; Sir J. Johnston, Bart.; Sir C. Lemon, Bart.; R. M. Milnes; G. R. Porter; M. Julien; S. Adair.

SECTION G.—Mechanics.

President.—G. Rennie.
Vice-Presidents.—W. Fairbairn; Sir J. Giest; J. Scott Russell; Professor Willis.
Secretaries.—Rev. W. T. Kingale.
Committee.—J. F. Bateman; Peter Clare; Rev. B. M. Cowie; T. Cowper; J. Dent; E. Hodgkinson; J. Jessop; R. Roberts; J. Taylor; J. Whitworth.

EVENING MEETING—THURSDAY.

The members assembled in the Senate House at eight o'clock, and the DEAN OF ELY, having taken the chair, stated that this meeting of the Association had a distinctive character from all preceding, by its connexion with the Magnetic Conference, which would include scientific men from all parts of Europe, who had resolved to meet on this occasion, and compare and co-ordinate their observations on magnetic and meteorological phenomena. He named several of the eminent men who had come to take a part in the conference, and alluded feelingly to the absence of Gauss, the great patriarch of magnetic science; and concluded by observing that the duties of his office were now fulfilled, and he had only to give place to Sir J. Herschel, whom he remembered as a competitor, but not as a rival, and with whom were associated those reminiscences which youth formed in its tenderness, and age hallowed in its memories.

Sir J. HERSCHEL, who was suffering from a severe cold, on taking the chair, briefly adverted to the eulogy of the Dean of Ely, as characterized by the partiality of youthful friendship, and then, apologizing for his defects of voice, read the following address:—

The President's Address.

Gentlemen,—The terms of kindness in which I have been introduced to your notice by my prede-

cessor in the office which you have called on me to fill, have been gratifying to me in no common degree—not as contributing to the excitement of personal vanity (a feeling which the circumstances in which I stand, and the presence of so many individuals every way my superiors, must tend powerfully to chastise), but as the emanation of a friendship begun at this University when we were youths together, preparing for our examinations for degrees, and contemplating each other, perhaps, with some degree of rivalry (if that can be called rivalry from which every spark of jealous feeling is absent). That friendship has since continued, warm and unshadowed for a single instant by the slightest cloud of disunion, and among all the stirring and deep-seated remembrances which the sight of these walls within which we are now assembled arouse, I can summon none more every way delightful and cheering than the contemplation of that mutual regard. It is, therefore, with no common feelings that I find myself now placed in this chair, as the representative of such a body as the British Association, and as the successor of such a friend and of such a man as its late President.

Gentlemen,—There are many sources of pride and satisfaction, in which *self* has no place, which crowd upon a Cambridge man in revisiting for a second time this University, as the scene of our annual labours. The development of its material splendour which has taken place in that interval of twelve years, vast and noble as it has been, has been more than kept pace with by the triumphs of its intellect, the progress of its system of instruction, and the influence of that progress on the public mind and the state of science in England. When I look at the scene around me—when I see the way in which our Sections are officered in so many instances by Cambridge men, not out of mere compliment to the body which receives us, but for the intrinsic merit of the men, and the pre-eminence which the general voice of society accords them in their several departments—when I think of the large proportion of the muster-roll of science which is filled by Cambridge names, and when, without going into any details, and confining myself to only one branch of public instruction, I look back to the vast and extraordinary development in the state of mathematical cultivation and power in this University, as evidenced both in its examinations and in the published works of its members, now, as compared with what it was in my own time—I am left at no loss to account for those triumphs and that influence to which I have alluded. It has ever been, and I trust it ever will continue to be, the pride and boast of this University to maintain, at a conspicuously high level, that sound and thoughtful and sobering discipline of mind which mathematical studies imply. Independent of the power which such studies confer as instruments of investigation, there never was a period in the history of science in which their moral influence, if I may so term it, was more needed, as a corrective to that propensity which is beginning to prevail widely, and I fear, balefully, over large departments of our philosophy, the propensity to crude and overhasty generalization. To all such propensities the steady concentration of thought, and its fixation on the clear and the definite which a long and stern mathematical discipline imparts, is the best, and, indeed, the only proper antagonist. That such habits of thought exist, and characterize, in a pre-eminent degree, the discipline of this University, with a marked influence on the subsequent career of those who have been thoroughly imbued with it, is a matter of too great notoriety to need proof. Yet, in illustration of this disposition, I may be allowed to mention one or two features of its Scientific History, which seem to me especially worthy of notice on this occasion. The first of these is the institution of the Cambridge University Philosophical Society, that body at whose more especial invitation we are now here assembled, which has now subsisted for more than twenty years, and which has been a powerful means of cherishing and continuing those habits among resident members of the University, after the excitement of reading for academical honours is past. From this society have emanated eight or nine volumes of memoirs, full of variety and interest, and such as no similar collection, originating as this has done in the bosom, and, in great measure, within the walls of an academical institution, can at all compare

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with; the Memoirs of the École Polytechnique of Paris, perhaps, alone excepted. Without undervaluing any part of this collection, I may be allowed to particularize, as adding largely to our stock of knowledge of their respective subjects, the Hydrodynamical contributions of Prof. Challis—the Optical and Photological papers of Mr. Airy—those of Mr. Murphy, on Definite Integrals—the curious speculations and intricate mathematical investigations of Mr. Hopkins on Geological Dynamics—and, more recently, the papers of Mr. De Morgan on the foundations of Algebra, which, taken in conjunction with the prior researches of the Dean of Ely and Mr. Warren on the geometrical interpretation of imaginary symbols in that science, have effectually dissipated every obscurity which heretofore prevailed on this subject. The elucidation of the metaphysical difficulties in question, by this remarkable train of speculation, has, in fact, been so complete, that henceforward they will never be named as difficulties, but only as illustrations of principle. Nor does its interest end here, since it appears to have given rise to the theory of Quaternions of Sir W. Hamilton, and to the Triple Algebra of Mr. De Morgan himself, as well as to a variety of interesting inquiries of a similar nature on the part of Mr. Graves, Mr. Cayley, and others. Conceptions of a novel and refined kind have thus been introduced into analysis—new forms of imaginary expression rendered familiar—and a vein opened which I cannot but believe will terminate in some first-rate discovery in abstract science.

Neither are inquiries into the logic of symbolic analysis, conducted as these have been, devoid of a bearing on the progress even of physical science. Every inquiry, indeed, has such a bearing which teaches us that terms which we use in a narrow sphere of experience, as if we fully understood them, may, as our knowledge of nature increases, come to have superadded to them a new set of meanings and a wider range of interpretation. It is thus that modes of action and communication, which we hardly yet feel prepared to regard as strictly of a material character, may, ere many years have passed, come to be familiarly included in our notions of Light, Heat, Electricity and other agents of this class; and that the transference of physical causation from point to point in space—nay, even the generation or development of attractive, repulsive or directive forces at their points of arrival may come to be enumerated among their properties. The late marvellous discoveries in actino-chemistry and the phenomena of muscular contraction as dependent on the will, are, perhaps, even now preparing us for the reception of ideas of this kind.

Another instance of the efficacy of the course of study in this university, in producing not merely expert algebraists, but sound and original mathematical thinkers—and, perhaps, a more striking one, from the generality of its contributors being men of comparatively junior standing, is to be found in the publication of *The Cambridge Mathematical Journal*, of which already four volumes, full of very original communications, are before the public. It was set on foot in 1837, by the late Mr. Gregory, Fellow of Trinity College, whose premature death has bereft Science of one who, beyond a doubt, had he lived, would have proved one of its chief ornaments, and the worthy representative of a family already so distinguished in the annals of mathematical and optical science. His papers on the 'Calculus of Operations,' which appeared in that collection, fully justifies this impression, while they afford an excellent illustration of my general position. Nor ought I to omit mentioning the Chemical Society, of whom he was among the founders, as indicative of the spirit of the place, untrammelled by abstract forms, and eager to spread itself over the whole field of human inquiry.

Another great and distinguishing feature in the scientific history of this place, is the establishment of its Astronomical Observatory, and the regular publication of the observations made in it. The science of Astronomy is so vast, and its objects so noble, that its practical study for its own sake is quite sufficient to insure its pursuit wherever civilization exists. But such institutions have a much wider influence than that which they exercise in forwarding their immediate object. Every astronomical observatory which publishes its observations, becomes a nucleus for the

formation around it of a school of exact practice—a standing and accessible example of the manner in which theories are brought to their extreme test—a centre, from which emanate a continual demand for and suggestion of refinements and delicacies, and precautions in matters of observation and apparatus which re-act upon the whole body of Science, and stimulate, while they tend to render possible an equal refinement and precision in all its processes. It is impossible to speak too highly of the mode in which the business of this institution is carried on under its present eminent director—nor can it be forgotten in our appreciation of what it has done for science, that in it our present Astronomer-Royal first proved and familiarized himself with that admirable system of astronomical observation, registry, and computation, which he has since brought to perfection in our great national observatory, and which have rendered it, under his direction, the pride and ornament of British Science, and the admiration of Europe.

Gentlemen, I should never have done if I were to enlarge on, or even attempt to enumerate the many proofs which this university has afforded of its determination to render its institutions and endowments efficient for the purposes of public instruction, and available to science. But such encomiums, however merited, must not be allowed to encroach too largely on other objects which I propose to bring before your notice, and which relate to the more immediate business of the present meeting, and to the general interests of science. The first and every way the most important, is the subject of the Magnetic and Meteorological Observatories. Every member of this Association is, of course, aware of the great exertions which have been made during the last five years, on the part of the British, Russian, and several other foreign governments, and of our own East India Company, to furnish data on the most extensive and systematic scale, for elucidating the great problems of Terrestrial Magnetism and Meteorology, by the establishment of a system of observatories all over the world, in which the phenomena are registered at intervals strictly simultaneous, and at intervals of two hours throughout both day and night. With the particulars of these national institutions, and of the multitude of local and private ones of a similar nature, both in Europe, Asia, and America, working on the same concerted plan, so far as the means at their disposal enable them, I need not detain you: neither need I enter into any detailed explanation of the system of Magnetic Surveys, both by sea and land, which have been executed or are in progress, in connexion with, and based upon the observations carried on at the fixed stations. These things form the subject of Special Annual Reports, which the Committee appointed for the purpose have laid before us at our several meetings, ever since the commencement of the undertaking; and the most recent of which will be read in the Physical Section of the present meeting, in its regular course. It is sufficient for me to observe, that the result has been the accumulation of an enormous mass of most valuable observations, which are now and have been for some time in the course of publication; and when thoroughly digested and discussed, as they are sure to be, by the talent and industry of magnetists and meteorologists, both in this country and abroad, cannot fail to place those sciences very far indeed in advance of their actual state. For such discussion, however, time must be allowed. Even were all the returns from the several observatories before the public, (which they are not, and are very far from being,) such is the mass of matter to be grappled with, and such the multitude of ways in which the observations will necessarily have to be grouped and combined to elicit mean results and quantitative laws, that several years must elapse before the full scientific value of the work done can possibly be realized.

Meanwhile, a question of the utmost moment arises, and which must be resolved, so far as the British Association is concerned, before the breaking up of this meeting. The second term of three years, for which the British Government and the East India Company have granted their establishments—nine in number—will terminate with the expiration of the current year, at which period, if no provision be made for their continuance, the observations at those establishments will of course cease, and with them,

beyond a doubt, those at a great many—probably the great majority—of the foreign establishments, both national and local, which have been called into existence by the example of England, and depend on that example for their continuance or abandonment. Now, under these circumstances, it becomes a very grave subject for the consideration of our Committee of Recommendations, whether to suffer this term to expire without an effort on the part of this Association to influence the Government for its continuance, or whether, on the other hand, we ought to make such an effort, and endeavour to secure either the continuance of these establishments for a further limited term, or the perpetuity of this or some equivalent system of observation in the same or different localities, according to the present and future exigencies of Science. I term this a grave subject of deliberation, and one which will call for the exercise of their soundest judgment; because, in the first place, this system of combined observation is by far the greatest and most prolonged effort of scientific co-operation which the world has ever witnessed; because, moreover, the spirit in which the demands of Science have been met on this occasion by our own Government, by the Company, and by the other governments who have taken part in the matter, has been, in the largest sense of the words, munificent and unstinting; and because the existence of such a spirit throws upon us a solemn responsibility to recommend nothing but upon the most entire conviction of very great evils consequent on the interruption, and very great benefits to accrue to Science from the continuance of the observations.

Happily we are not left without the means of forming a sound judgment on this tremendous question. It is a case in which, connected as the science of Britain is with that of the other co-operating nations, we cannot and ought not to come to any conclusion without taking into our counsels the most eminent magnetists and meteorologists of other countries who have either taken a direct part in the observations, or whose reputation in those sciences is such as to give their opinions, in matters respecting them, a commanding weight. Accordingly it was resolved, at the York meeting last year, to invite the attendance of the eminent individuals I have alluded to at this meeting, with the especial objects of conference on the subject. And in the interval since elapsed, knowing the improbability of a complete personal reunion from so many distant quarters, a circular has been forwarded to each of them, proposing certain special questions for reply, and inviting, besides, the fullest and freest communication of their views on the general subject. The replies received to this circular, which are numerous and in the highest degree interesting and instructive, have been printed and forwarded to the parties replying, with a request for their reconsideration and further communication, and have also been largely distributed at home to every member of our own Council, and the Committee of Recommendations, and to each member of the Council and Physical Committee of the Royal Society, which, conjointly with ourselves, memorialized Government for the establishment of the observatories.

In addition to the valuable matter thus communicated, I am happy to add, that several of the distinguished foreigners in question have responded to our invitation, and that in consequence this meeting is honoured by the personal presence of M. Kupffer, the Director-General of the Russian System of Magnetic and Meteorological Observation; of M. Ermann, the celebrated circumnavigator and meteorologist; of Baron von Senftenberg, the founder of the Astronomical, Magnetic, and Meteorological Observatory of Senftenberg; of M. Kreil, the director of the Imperial Observatory at Prague; and of M. Boguslawski, director of the Royal Prussian Observatory of Breslau, all of whom have come over for the express purpose of affording us the benefit of their advice and experience in this discussion. To all the conferences between these eminent foreigners and our own Magnetic and Meteorological Committee, and such of our members present as have taken any direct theoretical or practical interest in the subjects, all the members of our Committee of Recommendations will have free access for the purpose of enabling them fully to acquaint themselves with the whole bearing of the case, and the arguments used respect-

ing all the questions to be discussed, so that when the subject comes to be referred to them, as it must be if the opinion of the conference should be favourable to the continuance of the system, they may be fully prepared to make up their minds on it.

I will not say one word from this chair which can have the appearance of in any way anticipating the conclusion which the conference thus organized may come to, or the course to be adopted in consequence. But I will take this opportunity of stating my ideas generally on the position to be assumed by this Association and by other scientific bodies in making demands on the national purse for scientific purposes. And I will also state, quite irrespective of the immediate question of magnetic co-operation, and therefore of the fate of this particular measure, what I conceive to be the objects which might be accomplished, and ought to be aimed at in the establishment of PHYSICAL OBSERVATORIES, as part of the integrant institutions of each nation calling itself civilized, and as its contribution to Terrestrial Physics.

It is the pride and boast of an Englishman to pay his taxes cheerfully when he feels assured of their application to great and worthy objects. And as civilization advances, we feel constantly more and more strongly, that, after the great objects of national defence, the stability of our institutions, the due administration of justice, and the healthy maintenance of our social state, are provided for, there is no object greater and more noble—none more worthy of national effort than the furtherance of Science. Indeed, there is no surer test of the civilization of an age or nation than the degree in which this conviction is felt. Among Englishmen it has been for a long time steadily increasing, and may now be regarded as universal among educated men of all classes. No government, and least of all a British government, can be insensible to the general prevalence of a sentiment of this kind; and it is our good fortune, and has been so for several years, to have a government, no matter what its denomination as respects society, impossible with such considerations, and really desirous to aid the forward struggle of intellect, by placing at its disposal the material means of its advances.

But to do so with effect, it is necessary to be thoroughly well informed. The mere knowledge that such a disposition exists, is sufficient to surround those in power with every form of extravagant pretension. And even if this were not so, the number of competing claims, which cannot be all satisfied, can only harass and bewilder, unless there be somewhere seated a discriminating and selecting judgment, which, among many important claims, shall fix upon the most important, and urge them with the weight of well-established character. I know not where such a selecting judgment can be so confidently looked for as in the great scientific bodies of the country, each in its own department, and in this Association, constituted, in great measure, out of, and so representing them all, and numbering besides, among its members, abundance of men of excellent science and enlightened minds who belong to none of them. The constitution of such a body is the guarantee both for the general soundness of its recommendations, and for the due weighing of their comparative importance, should ever the claims of different branches of science come into competition with each other.

In performing this most important office of suggesting channels through which the fertilizing streams of national munificence can be most usefully conveyed over the immense and varied fields of scientific culture, it becomes us, in the first place, to be so fully impressed with a sense of duty to the great cause for which we are assembled, as not to hesitate for an instant in making a recommendation of whose propriety we are satisfied, on the mere ground that the aid required is of great and even of unusual magnitude. And on the other hand, keeping within certain reasonable limits of total amount, which each individual must estimate for himself, and which it would be unwise and indeed impossible to express in terms, it will be at once felt that *economy in asking* is quite as high a "distributive virtue" as *economy in granting*, and that every pound recommended unnecessarily is so much character thrown away. I make these observations because the principles they contain cannot be too frequently impressed, and by

no means because I consider them to have been overstepped in any part of our conduct hitherto. In the next place, it should be borne in mind that, in recommending to Government, not a mere grant of money, but a scientific enterprise or a national establishment, whether temporary or permanent, not only is it our duty so to place it before them that its grounds of recommendation shall be thoroughly intelligible, but that its whole proposed extent shall be seen—or at least if they cannot be, that it should be clearly stated to be the possible commencement of something more extensive—and besides, that the printing and publication of results should, in every such case, be made an express part of the recommendation. And, again, we must not forget that our interest in the matter does not cease with such publication. It becomes our duty to forward, by every encouragement in our power, the due consideration and scientific discussion of results so procured—to urge it upon the science of our own country and of Europe, and to aid from our own resources those who may be willing to charge themselves with their analysis, and to direct or execute the numerical computations or graphical projections it may involve. This is actually the predicament in which we stand, in reference to the immense mass of data already accumulated by the magnetic and meteorological observatories. Let the science of England, and especially the rising and vigorous mind which is pressing onward to distinction, gird itself to the work of grappling with this mass. Let it not be said that we are always to look abroad whenever industry and genius are required to act in union for the discussion of great masses of raw observation. Let us take example from what we see going on in Germany, where a Dove, a Kämtz and a Mahlmann are battling with the meteorology, a Gauss, a Weber and an Ermann with the magnetism of the world. The mind of Britain is equal to the task—its mathematical strength, developed of late years to an unprecedented extent, is competent to any theoretical analysis or technical combination. Nothing is wanting but the resolute and persevering devotion of undistracted thought to a single object, and that will not be long wanting when once the want is declared and dwelt upon, and the high prize of public estimation held forth to those who fairly and freely adventure themselves in this career. Never was there a time when the mind of the country, as well as its resources of every kind, answered so fully and readily to any call reasonable in itself and properly urged upon it. Do we call for facts? they are poured upon us in such profusion as for a time to overwhelm us, like the Roman maid who sank under the load of wealth she called down upon herself. Witness the piles of unredacted meteorological observations which load our shelves and archives; witness the immense and admirably arranged catalogues of stars which have been and still are pouring in from all quarters upon our astronomy so soon as the want of extensive catalogues came to be felt and declared. What we now want is *thought*, steadily directed to single objects, with a determination to eschew the besetting evil of our age—the temptation to squander and dilute it upon a thousand different lines of inquiry. The philosopher must be wedded to his subject if he would see the children and the children's children of his intellect flourishing in honour around him.

The establishment of astronomical observatories has been, in all ages and nations, the first public recognition of science as an integrant part of civilization. Astronomy, however, is only one out of many sciences, which can be advanced by a combined system of observation and calculation carried on uninterruptedly; where, in the way of experiment, man has no control, and whose only handle is the continual observation of Nature as it develops itself under our eyes, and a constant collateral endeavour to concentrate the records of that observation into empirical laws in the first instance, and to ascend from those laws to theories. Speaking in a utilitarian point of view, the globe which we inhabit is quite as important a subject of scientific inquiry as the stars. We depend for our bread of life and every comfort on its climates and seasons, on the movements of its winds and waters. We guide ourselves over the ocean, when astronomical observations fail, by our knowledge of the laws of its magnetism; we learn the sublimest lessons from the records of its

geological history; and the great facts which its figure, magnitude, and attraction, offer to mathematical inquiry, form the very basis of Astronomy itself. Terrestrial Physics, therefore, form a subject every way worthy to be associated with Astronomy as a matter of universal interest and public support, and one which cannot be adequately studied except in the way in which Astronomy itself has been—by permanent establishments keeping up an unbroken series of observation:—but with this difference, that whereas the chief data of Astronomy might be supplied by the establishment of a very few well worked observatories properly disposed in the two hemispheres—the gigantic problems of meteorology, magnetism, and oceanic movements can only be resolved by a far more extensive geographical distribution of observing stations, and by a steady, persevering, systematic attack, to which every civilized nation, as it has a direct interest in the result, ought to feel bound to contribute its contingent.

I trust that the time is not far distant when such will be the case, and when no nation calling itself civilized will deem its institutions complete without the establishment of a permanent physical observatory, with at least so much provision for astronomical and magnetic observation as shall suffice to make it a local centre of reference for geographical determinations and trigonometrical and magnetic surveys—which latter, if we are ever to attain to a theory of the secular changes of the earth's magnetism, will have to be repeated at intervals of twenty or thirty years for a long while to come. Rapidly progressive as our colonies are, and emulous of the civilization of the mother country, it seems not too much to hope from them, that they should take upon themselves, each according to its means, the establishment and maintenance of such institutions both for their own advantage and improvement, and as their contributions to the science of the world. A noble example has been set them in this respect, within a very few months, by our colony of British Guiana, in which a society recently constituted, in the best spirit of British co-operation, has established and endowed an observatory of this very description, furnishing it partly from their own resources and partly by the aid of government with astronomical, magnetic, and meteorological instruments, and engaging a competent observer at a handsome salary to work the establishment—an example which deserves to be followed wherever British enterprise has struck root and flourished.

The perfectly unbroken and normal registry of all the meteorological and magnetic elements—and of tidal fluctuations where the locality admits—would form the staple business of every such observatory, and, according to its means of observation, periodical phenomena of every description would claim attention, for which the list supplied by M. Queletel, which extends not merely to the phases of inanimate life, but to their effects on the animal and vegetable creation, will leave us at no loss beyond the difficulty of selection. The division of phenomena which magnetic observation has suggested, into periodical, secular, and occasional, will apply *mutatis mutandis* to every department. Under the head of occasional phenomena, storms, magnetic disturbances, aurora, extraordinary tides, earthquake movements, meteors, &c., would supply an ample field of observation—while among the secular changes, indications of the varying level of land and sea would necessitate the establishment of permanent marks, and the reference to them of the actual mean sea level which would emerge from a series of tidal observations, carried round a complete period of the moon's nodes with a certainty capable of detecting the smallest changes.

The abridgment of the merely mechanical work of such observatories by self-registering apparatus, is a subject which cannot be too strongly insisted on. Neither has the invention of instruments for superseding the necessity of much arithmetical calculation by the direct registry of total effects received anything like the attention it deserves. Considering the perfection to which mechanism has arrived in all its departments, these contrivances promise to become of immense utility. The more the merely mechanical part of the observer's duty can be alleviated, the more will he be enabled to apply himself to the theory of his subject, and to perform what I conceive ought to be regarded as the most important of all his

duties, and so considering the register local co-operation. The institutions the public best and most of their dis-
 Nothing absence himself. well remark of his dream daily phenomena and elicited expected it should the theories. I see but local persons station for w phenomena points of d progress, w view inspi vantage ov ground in thousand s ments occ generated, tribution f where a cl sirable; and some routi It is needl excited by scientific so occasion to are, howeve ing out of an itinerant one which the uniform eliminate a uncertainty The exceed vations can proved in t by which a secured to s another and ledge in the barometric whole Anta considerably found betw remarkable speculations the most in taken place circumnavig and voce ac commenced the further p Sir John F experiment nary pheno which, if ren of our whole latitudes, and ledge of the five cold pr of the Arctic of the great chief object cient answer such voyages it may pleas companions prie, and re country. I cannot q deploring the sustained in t of its most ex country. H not, the first aqueous and

duties, and which in time will come to be universally so considered—I mean the systematic deduction from the registered observations of the mean values and local co-efficients of diurnal, menstrual, and annual change. These deductions, in the case of permanent institutions, ought not, if possible, to be thrown upon the public, and their effective execution would be the best and most honourable test of the zeal and ability of their directors.

Nothing damps the ardour of an observer like the absence of an object appreciable and attainable by himself. One of my predecessors in this chair has well remarked, that a man may as well keep a register of his dreams as of the weather, or any other set of daily phenomena, if the spirit of grouping, combining, and eliciting results be absent. It can hardly be expected indeed, that observers of facts of this nature should themselves reason from them up to the highest theories. For that their position unfits them, as they see but locally and partially. But no other class of persons stands in anything like so favourable a position for working out the first elementary laws of phenomena, and referring them to their immediate points of dependence. Those who witness their daily progress, with that interest which a direct object in view inspires, have in this respect an infinite advantage over those who have to go over the same ground in the form of a mass of dry figures. A thousand suggestions arise, a thousand improvements occur—a spirit of interchange of ideas is generated, the surrounding district is laid under contribution for the elucidation of innumerable points, where a chain of corresponding observation is desirable; and what would otherwise be a scene of irksome routine, becomes a school of physical science. It is needless to say how much such a spirit must be excited by the institution of provincial and colonial scientific societies, like that which I have just had occasion to mention. Sea as well as land observations are, however, equally required for the effectual working out of these great physical problems. A ship is an itinerant observatory; and, in spite of its instability, one which enjoys several eminent advantages—in the uniform level and nature of the surface, which eliminate a multitude of causes of disturbance and uncertainty, to which land observations are liable. The exceeding precision with which magnetic observations can be made at sea, has been abundantly proved in the Antarctic Voyage of Sir James Ross, by which an invaluable mass of data has been thus secured to science. That voyage has also conferred another and most important accession to our knowledge in the striking discovery of a permanently low barometric pressure in high south latitudes over the whole Antarctic ocean—a pressure actually inferior by considerably more than an inch of mercury, to what is found between the Tropics. A fact so novel and remarkable will of course give rise to a variety of speculations as to its cause; and I anticipate one of the most interesting discussions which have ever taken place in our Physical Section, should that great circumnavigator favour us, as I hope he will, with a *rid roce* account of it. The voyage now happily commenced under the most favourable auspices for the further prosecution of our Arctic discoveries under Sir John Franklin, will bring to the test of direct experiment a mode of accounting for this extraordinary phenomenon thrown out by Colonel Sabine, which, if realized, will necessitate a complete revision of our whole system of barometric observation in high latitudes, and a total reconstruction of all our knowledge of the laws of pressure in regions where excessive cold prevails. This, with the magnetic survey of the Arctic seas, and the not improbable solution of the great geographical problem which forms the chief object of the expedition, will furnish a sufficient answer to those, if any there be, who regard such voyages as useless. Let us hope and pray, that it may please Providence to shield him and his brave companions from the many dangers of their enterprise, and restore them in health and honour to their country.

I cannot quit this subject without reverting to and deploring the great loss which science has recently sustained in the death of the late Prof. Daniell, one of its most eminent and successful cultivators in this country. His work on Meteorology is, if I mistake not, the first in which the distinction between the aqueous and gaseous atmospheres, and their mutual

independence, was clearly and strongly insisted on as a highly influential element in meteorological theory. Every succeeding investigation has placed this in a clearer light. In the hands of M. Dove, and more recently of Colonel Sabine, it has proved the means of accounting for some of the most striking features in the diurnal variations of the barometer. The continual generation of the aqueous atmosphere at the Equator, and its destruction in high latitudes, furnishes a *motive power* in meteorology, whose mode of action, and the mechanism through which it acts, have yet to be inquired into. Mr. Daniell's claims to scientific distinction were, however, not confined to this branch. In his hands, the voltaic pile became an infinitely more powerful and manageable instrument, than had ever before been thought possible; and his improvements in its construction (the effect not of accident, but of patient and persevering experimental inquiry), have in effect changed the face of Electro-Chemistry. Nor did he confine himself to these improvements. He applied them: and among the last and most interesting inquiries of his life, are a series of electro-chemical researches which may rank with the best things yet produced in that line.

The immediate importance of these subjects to one material part of our business at this meeting, has caused me to dwell more at length than perhaps I otherwise should on them. I would gladly use what time may remain without exciting your impatience, in taking a view of some features in the present state and future prospects of that branch of science to which my own attention has been chiefly directed, as well as to some points in the philosophy of science generally, in which it appears to me that a disposition is becoming prevalent towards lines of speculation, calculated rather to bewilder than enlighten, and, at all events, to deprive the pursuit of science of that which, to a rightly constituted mind, must ever be one of its highest and most attractive sources of interest, by reducing it to a mere assemblage of marrowless and meaningless facts and laws.

The last year must ever be considered an epoch in Astronomy, from its having witnessed the successful completion of the Earl of Rosse's six-feet reflector—an achievement of such magnitude, both in itself as a means of discovery, and in respect of the difficulties to be surmounted in its construction, (difficulties which perhaps few persons here present are better able from experience to appreciate than myself), that I want words to express my admiration of it. I have not myself been so fortunate as to have witnessed its performance, but from what its noble constructor has himself informed me of its effects on one particular nebula, with whose appearance in powerful telescopes I am familiar, I am prepared for any statement which may be made of its optical capacity. What may be the effect of so enormous a power in adding to our knowledge of our own immediate neighbours in the universe, it is of course impossible to conjecture; but for my own part I cannot help contemplating, as one of the grand fields open for discovery with such an instrument, those marvellous and mysterious bodies or systems of bodies, the Nebulae. By far the major part, probably, at least, nine-tenths of the nebulous contents of the heavens consist of nebulae of spherical or elliptical forms presenting every variety of elongation and central condensation. Of these a great number have been resolved into distinct stars, and a vast multitude more have been found to present that mottled appearance which renders it almost a matter of certainty that an increase of optical power would show them to be similarly composed. A not unnatural or unfair induction would therefore seem to be, that those which resist such resolution do so only in consequence of the smallness and closeness of the stars of which they consist; that, in short, they are only optically and not physically nebulous. There is, however, one circumstance which deserves especial remark, and which, now that my own observation has extended to the nebulae of both hemispheres, I feel able to announce with confidence as a general law, viz. that the character of easy resolvability into separate and distinct stars, is almost entirely confined to nebulae deviating but little from the spherical form; while, on the other hand, very elliptic nebulae, even large and bright ones, offer much greater difficulty in this respect. The cause of this difference must, of course, be conjectural,

but, I believe, it is not possible for any one to review *seriatim* the nebulous contents of the heavens without being satisfied of its reality as a physical character. Possibly the limits of the conditions of dynamical stability in a spherical cluster may be compatible with less numerous and comparatively larger individual constituents than in an elliptic one. Be that as it may, though there is no doubt a great number of elliptic nebulae in which stars have not yet been noticed, yet there are so many in which they *have*, and the gradation is so insensible from the most perfectly spherical to the most elongated elliptic form, that the force of the general induction is hardly weakened by this peculiarity; and for my own part I should have little hesitation in admitting all nebulae of this class to be, in fact, congeries of stars. And this seems to have been my father's opinion of their constitution, with the exception of certain very peculiar looking objects, respecting whose nature all opinion must for the present be suspended. Now, among all the wonders which the heavens present to our contemplation, there is none more astonishing than such close compacted families or communities of stars, forming systems either insulated from all others, or in binary connexion, as double clusters whose confines intermix, and consisting of individual stars nearly equal in apparent magnitude, and crowded together in such multitudes as to defy all attempts to count or even to estimate their numbers. What are these mysterious families? Under what dynamical conditions do they subsist? Is it conceivable that they can exist at all, and endure under the Newtonian law of gravitation without perpetual collisions? And, if so, what a problem of unimaginable complexity is presented by such a system if we should attempt to dive into its perturbations and its conditions of stability by the feeble aid of our analysis. The existence of a luminous matter, not congregated into massive bodies in the nature of stars, but disseminated through vast regions of space in a vaporous or cloud-like state, undergoing, or awaiting the slow process of aggregation into masses by the power of gravitation, was originally suggested to the late Sir W. Herschel in his reviews of the nebulae, by those extraordinary objects which his researches disclosed, which exhibit no regularity of outline, no systematic gradation of brightness, but of which the wisps and curls of a cirrus cloud afford a not inapt description. The wildest imagination can conceive nothing more capricious than their forms, which in many instances seem totally devoid of plan as much so as real clouds,—in others offer traces of a regularly hard less uncouth and characteristic, and which in some cases seems to indicate a cellular, in others a sheeted structure, complicated in folds as if agitated by internal winds.

Should the powers of an instrument such as Lord Rosse's succeed in resolving these also into stars, and, moreover, in demonstrating the starry nature of the regular elliptic nebulae, which have hitherto resisted such decomposition, the idea of a *nebulous matter*, in the nature of a shining fluid, or condensable gas, must, of course, cease to rest on any support derived from actual observation in the sidereal heavens, whatever countenance it may still receive in the minds of cosmogonists from the tails and atmospheres of comets, and the zodiacal light in our own system. But though all idea of its being ever given to mortal eye, to view aught that can be regarded as an outstanding portion of primeval chaos, be dissipated, it will by no means have been even then demonstrated that among those stars, so confusedly scattered, no aggregating powers are in action, tending to draw them into groups and insulate them from neighbouring groups; and, speaking from my own impressions, I should say that, in the structure of the Magellanic Clouds, it is really difficult not to believe we see distinct evidences of the exercise of such a power. This part of my father's general views of the construction of the heavens, therefore, being entirely distinct from what has of late been called "the nebulous hypothesis," will still subsist as a matter of rational and philosophical speculation,—and perhaps all the better for being separated from the other.

Much has been said of late of the Nebulous Hypothesis, as a mode of representing the origin of our own planetary system. An idea of Laplace, of which it is impossible to deny the ingenuity, of the successive abandonment of planetary rings, collecting them-

shelves into planets by a revolving mass gradually shrinking in dimension by the loss of heat, and finally concentrating itself into a sun, has been insisted on with some pertinacity, and supposed to receive almost demonstrative support from considerations to which I shall presently refer. I am by no means disposed to quarrel with the nebulous hypothesis even in this form, as a matter of pure speculation, and without any reference to final causes; but if it is to be regarded as a demonstrative truth, or as receiving the smallest support from any observed numerical relations which actually hold good among the elements of the planetary orbits, I beg leave to demur. Assuredly, it receives no support from observation of the effects of sidereal aggregation, as exemplified in the formation of globular and elliptic clusters, supposing them to have resulted from such aggregation. For were this the cause, working itself out in thousands of instances, it would have resulted, not in the formation of a single large central body, surrounded by a few much smaller attendants, disposed in one plane around it,—but in systems of infinitely greater complexity, consisting of multitudes of nearly equal luminaries, grouped together in a solid elliptic or globular form. So far, then, as any conclusion from our observations of nebulae can go, the result of agglomerative tendencies may, indeed, be the formation of families of stars of a general and very striking character; but we see nothing to lead us to presume its further result to be the surrounding of those stars with planetary attendants. If, therefore, we go on to push its application to that extent, we clearly theorize in advance of all inductive observation.

But if we go still farther, as has been done in a philosophical work of much mathematical pretension, which has lately come into a good deal of notice in this country,* and attempt "to give a mathematical consistency" to such a cosmogony by the "indispensable criterion" of "a numerical verification,"—and so exhibit, as "necessary consequences of such a mode of formation," a series of numbers which observation has established independent of any such hypothesis, as primordial elements of our system— if, in pursuit of this idea, we find the author first computing the time of rotation the sun must have had about its axis so that a planet situate on its surface and forming a part of it should not press on that surface, and should therefore be in a state of indifference as to its adhesion or detachment—if we find him, in this computation, throwing overboard as troublesome all those essential considerations of the law of cooling, the change of spheroidal form, the internal distribution of density, the probable non-circulation of the internal and external shells in the same periodic time, on which alone it is possible to execute such a calculation correctly; and avowedly, as a short cut to a result, using as the basis of his calculation "the elementary Huyghenian theorems for the evaluation of centripetal forces in combination with the law of gravitation"—a combination which, I need not explain to those who have read the first book of Newton, leads direct to Kepler's law;—and if we find him then gravely turning round upon us, and adducing the coincidence of the resulting periods compared with the distances of the planets with this law of Kepler, as being the numerical verification in question,—where, I would ask, is there a student to be found who has graduated as a Senior Optime in this University, who will not at once lay his finger on the fallacy of such an argument,† and declare it a vicious circle? I really

* M. Comte, *Phil. Positive*, ii. 376.

† M. Comte (*Philosophie Positive*, ii. 376, &c.), the author of the reasoning alluded to, assures us that his calculations lead to results agreeing only approximately with the exact periods, a difference to the amount of 1/43, the part more or less existing in all. As he gives neither the steps nor the data of his calculations, it is impossible to trace the origin of this difference,—which, however, must arise from error somewhere, if his fundamental principle be really what he states. For the Huyghenian measure of centrifugal force ($F \times \frac{v^2}{R}$) "combined" with "the law of gravitation" ($F \times \frac{M+m}{R^2}$), replacing V by its equivalent, $\frac{R}{P}$ can result in no other relation between P and R than what is expressed in the Keplerian law, and is incompatible with the smallest deviation from it.

Whether the sun threw off the planets or not, Kepler's law must be obeyed by them when once fairly detached. How, then, can their actual observance of this law be adduced in proof of their origin, one way or the other? How

should consider some apology needed for even mentioning an argument of the kind to such a meeting, were it not that this very reasoning, so ostentatiously put forward, and so utterly baseless, has been eagerly received among us; as the revelation of a profound analysis. When such is the case, it is surely time to throw in a word of warning, and to reiterate our recommendation of an early initiation into mathematics, and the cherishing a mathematical habit of thought, as the safeguard of all philosophy.

A very great obstacle to the improvement of telescopes in this country has been happily removed within the past year by the repeal of the duty on glass. Hitherto, owing to the enormous expense of experiments to private individuals not manufacturers—and to the heavy excise duties imposed on the manufacture, which has operated to repress all attempts on the part of practical men to produce glass adapted to the construction of large achromatics, our opticians have been compelled to resort abroad for their materials—purchasing them at enormous prices, and never being able to procure the largest sizes. The skill, enterprise and capital of the British manufacturer have now free scope, and it is our own fault if we do not speedily rival, and perhaps outdo the far-famed works of Munich and Paris. Indeed, it is hardly possible to over-estimate the effect of this fiscal change on a variety of other sciences to which the costliness of glass apparatus has been hitherto an exceeding drawback, not only from the actual expense of apparatus already in common use, but as repressing the invention and construction of new applications of this useful material.

A great deal of attention has been lately, and I think very wisely, drawn to the philosophy of science and to the principles of logic, as founded, not on arbitrary and pedantic forms, but on a careful inductive inquiry into the grounds of human belief, and the nature and extent of man's intellectual faculties. If we are ever to hope that science will extend its range into the domain of social conduct, and model the course of human actions on that thoughtful and effective adaptation of means to their end, which is its fundamental principle in all its applications (the means being here the total devotion of our moral and intellectual powers—the end, our own happiness and that of all around us)—if such be the far hopes and long protracted aspirations of science, its philosophy and its logic assume a paramount importance, in proportion to the practical danger of erroneous conceptions in the one, and fallacious tests of the validity of reasoning in the other.

On both these subjects works of first-rate importance have of late illustrated the scientific literature of this country. On the philosophy of science, we have witnessed the production, by the pen of a most distinguished member of this University, of a work so comprehensive in its views, so vivid in its illustrations, and so right-minded in its leading directions, that it seems to me impossible for any man of science, be his particular department of inquiry what it may, to rise from its perusal without feeling himself strengthened and invigorated for his own especial pursuit, and placed in a more favourable position for discovery in it than before, as well as more competent to estimate the true philosophical value and import of any new views which may open to him in its prosecution. From the peculiar and *a priori* point of view in which the distinguished author of the work in question has thought proper to place himself before his subject, many may dissent; and I own myself to be of the number;—but from this point of view it is perfectly possible to depart without losing sight of the massive reality of that subject itself: on the contrary, that reality will be all the better seen and understood, and its magnitude felt when viewed from opposite sides, and under the influence of every accident of light and shadow which peculiar habits of thought may throw over it.

Accordingly, in the other work to which I have alluded, it is proved that the sun must have thrown off planets at those distances, and at no other, where we find them,—no matter in what times revolving? That, indeed, would be a powerful presumptive argument; but what geometer will venture on such a *tour d'analyse*? And, lastly, how can it be adduced as a numerical coincidence of an hypothesis with observed fact to say that, at an unknown epoch, the sun's rotation (not observed) must have been so and so, if the hypothesis were a true one?

‡ Mill. *Logic*, ii. 28.—Also, "Vestiges of the Creation," p. 17.

made allusion, and which, under the title of a "System of Logic," has for its object to give "a connected view of the principles of evidence and the methods of scientific investigation"—its acute, and in many respects profound author—taking up an almost diametrically opposite station, and looking to experience as the ultimate foundation of all knowledge—at least, of all scientific knowledge—in its simplest axioms as well as in its most remote results—has presented us with a view of the inductive philosophy, very different indeed in its general aspect—but in which, when carefully examined, most essential features may be recognized as identical, while some are brought out with a salience and effect which could not be attained from the contrary point of sight. It cannot be expected that I should enter into any analysis or comparison of these remarkable works—but it seemed to me impossible to avoid pointedly mentioning them on this occasion, because they certainly, taken together, leave the philosophy of science, and indeed the principles of all general reasoning, in a very different state from that in which they found them. Their influence, indeed, and that of some other works of prior date, in which the same general subjects have been more lightly touched upon, has already begun to be felt and responded to from a quarter where, perhaps, any sympathy in this respect might hardly have been looked for. The philosophical mind of Germany has begun, at length, effectually to awaken from the dreamy trance in which it had been held for the last half-century, and in which the jargon of the Absolutists and Ontologists had been received as oracular. An "anti-speculative philosophy" has arisen and found supporters—rejected, indeed, by the Ontologists, but yearly gaining ground in the general mind. It is something so new for an English and a German philosopher to agree in their estimate either of the proper objects of speculation or of the proper mode of pursuing them, that we greet, not without some degree of astonishment, the appearance of works like the *Logic* and the *New Psychology* of Beneke, in which this false and delusive philosophy is entirely thrown aside, and appeal at once to the nature of things as we find them, and to the laws of our intellectual and moral nature, as our own consciousness and the history of mankind reveals them to us.*

Meanwhile, the fact is every year becoming more broadly manifest, by the successful application of scientific principles to subjects which had hitherto been only empirically treated (of which agriculture may be taken as perhaps the most conspicuous instance), that the great work of Bacon was not the completion, but, as he himself foresaw and foretold, only the commencement of his own philosophy; and that we are even yet only at the threshold of that palace of Truth which succeeding generations will range over as their own—a world of scientific inquiry, in which not matter only and its properties, but the far more rich and complex relations of life and thought, of passion and motive, interest and actions, will come to be regarded as its legitimate objects. Nor let us fear that in so regarding them we run the smallest danger of collision with any of those great principles which we regard, and rightly regard, as sacred from question. A faithful and undoubting spirit carried into the inquiry, will secure us from such dangers, and guide us, like an instinct, in our paths through that vast and enlarged region which intervenes between those ultimate principles and their extreme practical applications. It is only by working our way upwards towards those principles as well as downwards from them, that we can ever hope to penetrate such intricacies, and thread their maze; and it would be worse than folly—it would be treason against our highest feelings—to doubt that to those who spread themselves over these opposite lines, each moving in his own direction, a thousand points of meeting and mutual and joyful recognition will occur.

But if Science be really destined to expand its scope, and embrace objects beyond the range of merely material relation, it must not altogether and obstinately refuse, even within the limits of such relations, to admit conceptions which at first sight may seem to trench upon the immaterial, such as we have been accustomed to regard it. The time seems to be approaching when a merely mechanical view of nature

* Vide Beneke, *Neue Psychologie*, s. 300 et seq. for an admirable view of the state of metaphysical and logical philosophy in Germany.

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will become impossible.—when the notion of accounting for all the phenomena of nature, and even of mere physics, by simple attractions and repulsions fixedly and unchangeably inherent in material centres (granting any conceivable system of Bosovichian alternations), will be deemed untenable. Already we have introduced the idea of *heat-atmospheres* about particles to their repulsive forces according to definite laws. But surely this can only be regarded as one of those provisional and temporary conceptions which, though it may be useful as helping us to laws, and as suggesting experiments, we must be prepared to resign if ever such ideas, for instance, as radiant stimulus or conducted influence should lose their present vagueness, and come to receive some distinct scientific interpretation. It is one thing, however, to suggest that our present language and conceptions should be held as provisional.—another to recommend a general unsettling of all received ideas. Whatever innovations of this kind may arise, they can only be introduced slowly, and on a full sense of their necessity; for the limited faculties of our nature will bear but little of this sort at a time without a kind of intoxication, which precludes all rectilinear progress—or, rather, all progress whatever, except in a direction which terminates in the wildest vagaries of mysticism and clairvoyance.

But, without going into any subtleties, I may be allowed to suggest that it is at least high time that philosophers, both physical and others, should come to some nearer agreement than appears to prevail as to the meaning they intend to convey in speaking of causes and causation. On the one hand we are told that the grand object of physical inquiry is to explain the phenomena of nature, by referring them to their causes: on the other, that the inquiry into causes is altogether vain and futile, and that Science has no concern, but with the discovery of *laws*. Which of these is the truth? Or are both views of the matter true on a different interpretation of the terms? Whichever view we may take, or whichever interpretation adopt, there is one thing certain,—the extreme inconvenience of such a state of language. This can only be reformed by a careful analysis of this widest of all human generalizations, disentangling from one another the innumerable shades of meaning which have got confounded together in its progress, and establishing among them a rational classification and nomenclature. Until this is done we cannot be sure, that by the relation of cause and effect one and the same kind of relation is understood. Indeed, using the words as we do, we are quite sure that the contrary is often the case; and so long as uncertainty in this respect is suffered to prevail, so long will this unseemly contradiction subsist, and not only prejudice the cause of science in the eyes of mankind, but create disunion of feeling, and even give rise to accusations and recriminations on the score of principle among its cultivators.

The evil I complain of becomes yet more grievous when the idea of *law* is brought so prominently forward as not merely to throw into the background that of *cause*, but almost to thrust it out of view altogether; and if not to assume something approaching to the character of direct agency, at least to place itself in the position of a substitute for what mankind in general understand by *explanation*: as when we are told, for example, that the successive appearance of races of organized beings on earth, and their disappearance, to give place to others, which Geology teaches us,—is a result of some certain law of development, in virtue of which an unbroken chain of gradually exalted organization from the crystal to the globe, and thence, through the successive stages of the polypus, the mollusk, the insect, the fish, the reptile, the bird, and the beast, up to the monkey and the man (nay, for aught we know, even to the angel), has been (or remains to be) evolved. Surely, when we hear such a theory, the natural, human craving after *causes*, capable in some conceivable way of giving rise to such changes and transformations of organ and intellect,—*causes why* the development at different parts of its progress should divaricate into different lines,—*causes, at all events, intermediate between the steps of the development*—becomes important. And when nothing is offered to satisfy this craving, but loose and vague reference to *favourable circumstances* of climate, food, and general situation, which no experience has ever shown to convert one

species into another; who is there who does not at once perceive that such a theory is in no respect more *explanatory*, than that would be which simply asserted a miraculous intervention, at every successive step of that unknown series of events, by which the earth has been alternately peopled and dispeopled of its denizens?

A law may be a rule of action, but it is not action. The Great First Agent may lay down a rule of action for himself, and that rule may become known to man by observation of its uniformity: but constituted as our minds are, and having that conscious knowledge of causation, which is forced upon us by the reality of the distinction between *intending* a thing, and *doing* it, we can never substitute the *Rule* for the *Act*. Either directly, or through delegated agency, whatever takes place is not merely *willed*, but *done*, and what is done we then only declare to be explained, when we can trace a process, and show that it consists of steps analogous to those we observe in occurrences which have passed often enough before our own eyes to have become familiar, and to be termed *natural*. So long as no such process can be traced and analyzed out in this manner, so long the phenomenon is unexplained, and remains equally so whatever be the number of unexplained steps inserted between its beginning and its end. The transition from an inanimate crystal to a globe capable of such endless organic and intellectual development, is as great a step—as unexplained a one—as unintelligible to us—and in any human sense of the word as *miraculous* as the immediate creation and introduction upon earth of every species and every individual would be. Take these amazing facts of geology which way we will, we must resort elsewhere than to a mere speculative law of development for their explanation.

Visiting as we do once more this scene of one of our earliest and most agreeable receptions—as travellers on the journey of life brought back by the course of events to scenes associated with exciting recollections and the memory of past kindness—we naturally pause and look back on the interval with that interest which always arises on such occasions, “How has it fared with you meanwhile?” we fancy ourselves asked.—“How have you prospered?”—“Has this long interval been well or ill spent?”—“How is it with the cause in which you have embarked?”—“Has it flourished or receded, and to what extent have you been able to advance it?” To all these questions we may, I believe, conscientiously, and with some self-gratulation, answer—Well! The young and then but partially fledged institution has become established and matured. Its principles have been brought to the test of a long and various experience, and been found to work according to the expectations of its founders. Its practice has been brought to uniformity and consistency, on rules which, on the whole, have been found productive of no inconvenience to any of the parties concerned. Our calls for reports on the actual state and deficiencies of important branches of science, and on the most promising lines of research in them, have been answered by most valuable and important essays from men of the first eminence in their respective departments, not only condensing what is known, but adding largely to it, and in a multitude of cases entering very extensively indeed into original inquiries and investigations—of which Mr. Scott Russell’s Report on Waves, and Mr. Carpenter’s on the Structure of Shells, and several others in the most recently published volume of our Reports, that for the York meeting last summer, may be specified as conspicuous instances.

Independent of these Reports, the original communications read or verbally made to our several Sections, have been in the highest degree interesting and copious; not only as illustrating and extending almost every branch of science, but as having given rise to discussions and interchanges of idea and information between the members present, of which it is perfectly impossible to appreciate sufficiently the influence and value. Ideas thus communicated fructify in a wonderful manner on subsequent reflection, and become, I am persuaded, in innumerable cases, the germs of theories, and the connecting links between distant regions of thought, which might have otherwise continued indefinitely dissociated.

How far this Association has hitherto been instru-

mental in fulfilling the ends for which it was called into existence, can, however, be only imperfectly estimated from these considerations. Science, as it stands at present, is not merely advanced by speculation and thought; it stands in need of material appliances and means; its pursuit is costly, and to those who pursue it for its own sake, utterly unremunerative, however largely the community may benefit by its applications, and however successfully practical men may turn their own or others’ discoveries to account. Hence arises a wide field for scientific utility in the application of pecuniary resources in aid of private research, and one in which assuredly this Association has not held back its hand. I have had the curiosity to cast up the sums which have been actually paid, or are now in immediate course of payment, on account of grants for scientific purposes by this Association since its last meeting at this place, and I find them to amount to not less than 11,167l. And when it is recollected that in no case is any portion of these grants applied to cover any personal expense, it will easily be seen how very large an amount of scientific activity has been brought into play by its exertions in this respect, to say nothing of the now very numerous occasions in which the attention and aid of Government has been effectually drawn to specific objects at our instance.

As regards the general progress of Science within the interval I have alluded to, it is far too wide a field for me now to enter upon, and it would be needless to do so in this assembly, scarcely a man of which has not been actively employed in urging on the triumphant march of its chariot wheels, and felt in his own person the high excitement of success joined with that noble glow which is the result of companionship in honourable effort. May such ever be the prevalent feeling among us. True Science, like true Religion, is wide-embracing in its extent and aim. Let interests divide the worldly and jealousies torment the envious! We breathe, or long to breathe, a purer empyrean. The common pursuit of Truth is of itself a brotherhood. In these our annual meetings, to which every corner of Britain—almost every nation in Europe sends forth as its representative some distinguished cultivator of some separate branch of knowledge; where, I would ask, in so vast a variety of pursuits which seem to have hardly anything in common, are we to look for that acknowledged source of delight which draws us together and inspires us with a sense of unity? That astronomers should congregate to talk of stars and planets—chemists of atoms—geologists of strata—is natural enough; but what is there of *equal* mutual interest, *equally* connected with and *equally* pervading all they are engaged upon, which causes their hearts to burn within them for mutual communication and un-bosoming? Surely, were each of us to give utterance to all he feels, we should hear the Chemist, the Astronomer, the Physiologist, the Electrician, the Botanist, the Geologist, all with one accord, and each in the language of his own science, declaring not only the wonderful works of God disclosed by it, but the delight which their disclosure affords him, and the privilege he feels it to be to have aided in it. This is indeed a magnificent induction—a consilience there is no refusing. It leads us to look onward, through the long vista of time, with chastened but confident assurance that Science has still other and nobler work to do than any she has yet attempted; work, which before she is prepared to attempt, the minds of men must be prepared to receive the attempt,—prepared, I mean, by an entire conviction of the wisdom of her views, the purity of her objects, and the faithfulness of her disciples.

Mr. EVERETT, the American Minister, was then introduced to the meeting. He observed that though he felt himself to be an unworthy representative of the men of science in the United States, he felt that he could with confidence declare that they joined with him in recognizing both the personal and the hereditary claims to distinction of Sir John Herschel. His illustrious father had added “to the lyre of heaven another string,” and given to an inconspicuous star a place in our own system, though so distant that it had scarce yet completed a single revolution since its discovery. He doubted not that Meteorology and Magnetism and Science generally would be as much indebted to the son, as Astronomy had been to the father. The people of the United States had shown,

that they were not insensible to the appeal which Sir J. Herschel had made to the governments of the civilized world, to attend to the phenomena of Terrestrial Magnetism and Meteorology. There already existed 160 stations in America at which observations were made and recorded. He had that day presented the observations made at New Cambridge, and he read part of a letter from New York, stating the advantage that would result from the British government continuing, northwards, the observations that had been made in the States. He hoped that this emulation in aiding the progress of Science and securing the practical benefits of Knowledge would be the only rivalry which would ever exist between the two countries. He then feelingly alluded to himself as an alumnus of New Cambridge, and observed that if the philanthropic founder of that institution, who had come from Emmanuel College in Old Cambridge, could have anticipated the progress of either university, the prospect would have been one of the noblest ever opened to the eye of prophetic intelligence. Having once more alluded to the community of interest in Literature and Science which must ever identify the intelligence of England with that of America, he proposed that the thanks of the meeting should be given to Sir J. Herschel.

The motion was seconded by the Marquis of Northampton, and passed unanimously.

The announcements made by the Treasurer and Secretary in Committee were then repeated to the general body, and the meeting adjourned.

OUR WEEKLY GOSPEL.

We may, when at leisure, offer a few words of comment on Mr. Pettigrew's letter to the Dean of Hereford; meanwhile, we publish the following from the Dean himself:—

London, June 18, 1845.

A printed letter having been addressed to me by Mr. Pettigrew, in alleged reply to a correspondence which certain comments on my motives and conduct in the first number of a new Archaeological Journal induced me to print, I will beg the favour of you to allow the *Athenæum* to be the vehicle of announcing to all such as may take any interest in the matter, that this correspondence may be obtained at Mr. Nicol's, 60, Pall Mall.

As I have never troubled you before with any communications on this subject, I trust you will not think the insertion of this letter in your journal too great a sacrifice of its space. I avail myself of this expedient the more readily, because I have seen nothing which induces me to alter my opinions since that correspondence occurred; and I think a perusal of it will fairly show the real bearings of the case with respect to the Archaeological Association, the part I was induced to take, and the treatment I have experienced. Having, some time since, for good reasons, informed Mr. Pettigrew that I would not continue any correspondence with him, I should have felt myself precluded from any personal communication to that individual, even if the tone and style of his printed letter did not render it entirely beneath my notice.

In reference to a remark in the last number of your journal, I will beg to add, that I am positively certain that I paid to Mr. C. Roach Smith the price of my ticket of admission to the Canterbury Congress, on the day of my arrival. In reminding him of that fact, last week, I felt certain that his omission to account for it could only have arisen from the constant engagement of his thoughts and attention, of necessity resulting from the very onerous duties to which his zeal for Archaeology and his anxiety for the prosperous issue of the Congress induced him to devote himself on that occasion. I have the honour, &c.

JOHN MEKEWETHER, Dean of Hereford.

The Presidency of the Royal Academy has, we understand, been resigned by Sir M. A. Shee; and we regret to learn that continued ill health has been the inducing cause.

The daily journals announce the death, on the 17th instant, of the Rev. Richard Harris Barham, B.A., Minor Canon of St. Paul's, Rector of St. Augustine and St. Faith, and Priest of Her Majesty's Chapels Royal;—under which very grave and clerical description many of our readers may fail to recognize the popular humourist who has so often amused them by tale and legend, under the secular signature of "Ingoldsby." He was the author, too, of "Cousin Nicholas," a novel originally published in *Blackwood's Magazine*. As a whimsical and peculiar writer, his loss will be felt.

The Commissioners of the Fine Arts have entrusted Messrs. Foley, Marshall and Bell with the execution respectively of the statues of *Hampton, Falkland and Clarendon*, for the New Houses of Parliament. Mr. Bell is the sculptor of the 'Eagle-Slayer' and 'Jane Shore,'—Mr. Marshall of the 'Eve Gathering the Apple,'—and Mr. Foley of the 'Youth at a Stream,'—all of which were exhibited in the

collection at Westminster Hall, and had notice, more or less honourable, in the *Athenæum*, at the time, [No. 872].

A correspondent informs us, that our statement, last week, relative to the recent competition and ballot for the architect who should rebuild the Carlton Club House is, in part, incorrect as regards Mr. Barry. No second competition has taken place, and consequently, that gentleman did not depart from his known resolution of declining to compete. The ballot, which has recently taken place, was for the appointment of an architect; without any reference whatever to the previous competition, which was considered to be disposed of when the premiums were awarded to Messrs. Salvin and Hopper, and Mr. Barry's name was proposed without any solicitation on his part.

A project is on foot, to which we heartily wish success, for an Exhibition of the Products of British Industry. The following circular has just reached us. "The exhibitions of National Industry, which attract so much attention on the Continent, have suggested to the Members of the Society of Arts, and to some distinguished manufacturers, the possibility of establishing something of the same kind in the British Empire. They have thought that a country which is eminent in all, and unrivalled in many, of the industrial arts, would be enabled to concentrate such a display of intellect, energy and resources, as probably has never yet been witnessed. Besides the delight and instruction which would certainly be afforded, it may fairly be expected that a periodical competition of this nature will exert some beneficial effect on the progress of the Arts; not only by exciting honourable rivalry in the producers, but by enabling the consumers better to appreciate real excellence. Without entering into details, it may be stated, that the plan embraces the exhibition not merely of products, but of the instruments of production in actual work—the facility, rapidity, precision and economy of the act of fabrication being often much more wonderful than the fabric itself. In carrying out these ideas, it is intended entirely to exclude all private, personal, and political objects. It is hoped that the plan may be preserved so free from objection on these points, as to command the approbation of all ranks, and justify its promoters in anticipating the highest patronage." All persons anxious to aid in the project, should address themselves to Mr. F. Whishaw, Society of Arts, London.

The thirteenth session of the Scientific Congress of France will open, at Rheims, on the 1st of September next.

Among the subjects of deliberation, at the recent congress of German booksellers in Leipzig, was the realization of that project which we, some time since, announced to our readers, for the establishment, in one of the large transatlantic cities, of a great central dépôt; by means of which their native works should be published simultaneously in Germany and America, and the American pirates defeated. This plan, a good practical anticipation of treaties, it has been determined to carry into effect at New York; and a delegate has been appointed to proceed to that city, and take steps for founding the establishment.—The city in question, by the way, has sustained a calamity similar to that which, not many weeks since, we had to record as having befallen at Washington. The Bowery Theatre has been burnt to the ground.—for the fourth time since the year 1828.

From Paris, we learn that the *Académie Française*, last week, awarded its Montyon prizes, for the works of literature most useful to the cause of morals.

The Academy of Inscriptions and Belles Lettres, at its sitting last week, also decided on the Gobert prizes in its distribution. The large prize of 9,000 francs it awarded to M. de Pétigny, for his *Etudes sur l'Histoire, les Lois et les Institutions de l'Epoque Mérovingienne*: and confirmed M. Alexis Monteil in his possession of the lesser prize, given to him for his *Histoire des Français des Divers Etats*.—From Mende, we hear that the Episcopal Palace, with all the valuable objects which it contained, has been utterly consumed in a conflagration communicated to it by lightning.

We have given more than one example of the manner in which the spirit of association is directing itself to the attack of prejudices, by taking under its immediate protection, the object of the prejudice itself

—attaining, for instance, in some of the cases, by its own voluntary action, what the coercion of summary laws has always been powerless to effect. At Berlin, a curious example of the same philosophy is given. In that capital, as elsewhere, there are various classes of funeral procession; the lowest of which, called "the third-class hearse," is in disrepute amongst the Berliners; and many a father of a family, to avoid its reproach, incurs expenses for his dead beyond his means. The *Gazette of Leipzig* announces that a society has been formed, taking its title from the *third-class hearse*, and whose members engage that they and their families shall only be conveyed to their graves by that contemned carriage.

From Berlin, we hear that the Minister of Public Instruction has commissioned Professor Kugler, who has long been the Historian of the Fine Arts in his department, to visit France, Belgium, Holland, Switzerland, and Bavaria; there to examine, in detail, the organization of the Schools and Academies of Art, as well as of the various administrations charged with the conservation of national monuments.—From the same capital we learn that the printing of the complete edition of the works of Frederick the Great, undertaken by government, is proceeding with great activity at the presses of the Royal Academy of Sciences. The edition will be divided into five sections; the first, containing the historical works, has just appeared, in 3 vols. The second section will comprise the philosophical works, in 3 vols.; the third, the poetical in 6; the fourth, the correspondence, in 12; and the fifth, the military works, in 2—twenty-six in all. The last section will include, it is said, a great number of important documents, wholly unpublished; amongst others, thirty-two secret instructions from the "great" king to his generals—and as we have already announced, a large variety of unpublished letters.

The committee of the Goethe Monument, having fulfilled its purpose, has dissolved itself, after publishing a statement of its proceedings. The Monument has cost 38,924 florins; and Frankfurt has herself subscribed nearly the entire amount. Schwanthaler, the sculptor, accepted only 5,000 florins for his work; and this sum he distributed amongst the poor of Frankfurt.

From Bonn, they write, on the 7th inst., that the will of Schlegel was opened in the preceding week; and that the illustrious writer has therein bequeathed all his unpublished manuscripts to the celebrated archaeologist, Welcker, professor at the Royal University of Bonn, with a request that he will cause them to be published.—The writing-desk left by the critic to the King of Prussia, in massive silver, was a gift to himself, and is from Madame de Staël.

It is not long since we announced to our readers that the Austrian Government had, at length, determined to concede to the spirit of the times a relaxation of its system of literary censorship; and that instructions to that effect were in course of preparation. We are bound, therefore, to acquaint them, that the resolutions of the Aulic cabinet have now appeared; and—on the faith of *l'oeu Revue de Paris*—that the Emperor's promise of a free press has resulted in a mere increase in the number and salaries of the censors—substituting a more rapid execution of literary offenders for the lingering agony of years to which they were subjected under the former imperfect official provision.—The foreign papers mention, also, that the surviving volunteers of the Free Corps of Lutzw, which inrolled itself during the latter years of the German struggle against the French empire, and was composed, in great part, of the students of the German universities, held a festival, on the 16th inst., the anniversary of the Battle of Ligny, in the little village of Wobbelin, in the grand-duchy of Mecklenburg-Schwerin, beside the grave of the poet Theodore Körner.

The Cabinet of Medals, in the Royal Library of Paris, has been enriched by a present of considerable archaeological value, from the Prince Torlonia, Duke of Ceri—twenty vases, found, in 1835, in the excavations undertaken in the metropolis of Agrigola, which forms part of his duchy. Ceri is the modern form given to the name of the ancient Cera, one of the most celebrated of the cities of Etruria.—We may add that M. de Mersan, one of the conservators of

the *Bibliothèque* of the Society

We may, the Royal construction Egyptian sepulchre lately received Pharaoh reproduced banks of the

Our real premiums, which some habit of of standing, a perfect attache we have given in which, it is seizing upon search, and country, the and placed succeeded—a partnership enables it to subscribers sary on that du *Matin* is of a votive Star" promotes on a heath one of the Loretto" is "Morning

ROYAL AC The EXHIB -Admission, 6d.

THE NEW SC The ELEVE their GALLER Catalogue, 6d.

DIORAMA MITTANCE— exhibition, repr (formerly the vari ing, and the ex at Paris, as seen universally adm nos. Open fro 1c., Stalls, 2s.

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THE ATMC visitors, at the interesting Mo "Clock daily; Eight o'clock, days at Nine o' Lecture. It is time.—The oth Admission, 1s.

SCIENCE

ROYAL S V.P. in the tro-Physiol Professor M arrangement experiments currents. I employment sensibility of sufficient in the use of obtained fro.—In the fir muscular cu gas in which it is altogether portion of t stances whic tenacity are the calulatory syst seem to act hydro-cyanic influence on retted hydro

the *Bibliothèque Royale*, has been elected a member of the Society of Antiquaries in London.

We may mention, too, that, in the Court-Yard of the Royal Library, preparations are making for the construction of a Hypogeum, in imitation of the Egyptian subterranean monuments. The walls of this sepulchre are to be covered over with the bas-reliefs lately received from Karnak; and the Monument of the Pharaohs, nearly 4000 years old, will, it is said, be reproduced in the state in which it was found on the banks of the Nile.

Our readers are well acquainted with those premiums, in the form of a book or an engraving, which some of our English newspapers are in the habit of offering to their subscribers of a certain standing, as a supplementary inducement to the imperfect attraction of their own literary wares; and we have given many recent examples of the manner in which, in France, the spirit of literary speculation is seizing upon every form of action presented to its search, and inventing new ones. A journal of that country, the *Etoile du Matin*, dedicated to youth, and placed under the protection of the Virgin, has succeeded—by her interest, we suppose,—in effecting a partnership arrangement with Heaven, which enables it to offer spiritual premiums to its earthly subscribers—to found the prosperity of its own treasury on that of its readers' souls. To take the *Etoile du Matin* is to be, itself, a work of grace, and worthy of a votive record; and, accordingly, the "Morning Star" promises to write the names of all its subscribers on a heart of gold, and dedicate the said heart in one of the chapels of Christianity. "Our Lady of Loretto" is, this year, to be the book-keeper of the "Morning Star."

ROYAL ACADEMY OF ARTS, TRAFALGAR SQUARE. THE EXHIBITION OF THE ROYAL ACADEMY IS NOW OPEN. Admission, (from Eight o'clock till Seven) 1s.; Catalogue, 1s.

THE NEW SOCIETY OF PAINTERS IN WATER COLOURS. THE ELEVENTH ANNUAL EXHIBITION IS NOW OPEN at their GALLERY, FIFTY-THREE, PAUL MALL.—Admission, 1s.; Catalogue, 6d.

DIORAMA, REGENT'S PARK.—REDUCED PRICE OF ADMITTANCE.—Now Opened, with a new and highly interesting exhibition, representing the CASTLE and TOWN of HEDELBERG (formerly the residence of the Elector Palatine of the Rhine) under the various aspects of Winter and Summer, Mid-day and Evening; and the exterior view of the CATHEDRAL of NOTRE DAME de Paris, as seen at Sunset and by Moonlight, and which has been so universally admired. Both pictures are painted by Le Chevalier Reus, Open from 10 till 6. Admittance to view both Pictures—Saloon, 1s.; Stalls, 2s. as heretofore.

PANORAMA OF NANKING. JUST OPENED, at the PANORAMA ROYAL, LEICESTER SQUARE, a View of Nanking, the ancient capital of the Celestial Empire, with its unrivalled Porcelain Tower; comprising also, the Yang-Tse-Kiang River, with Her Majesty's ships at anchor; the various bridges and canals, the adjacent heights, temples, and Josses houses, with portraits of Sir H. Pottinger, Lord Salisbery, Sir H. Gough, and other officers in friendly communication with Elepée, The-lins, and Men Thien, the three Chinese Commissioners, and various other groups around them. The View of Nanking by Moonlight is now open, but Baden-Baden will shortly be closed.

THE ATMOSPHERIC RAILWAY, Daily at Work, carrying visitors, at the ROYAL POLYTECHNIC INSTITUTION. This interesting Model is lectured on by Professor Bachoffner at One o'clock daily; also on the evenings of Wednesdays and Fridays at Eight o'clock, and on the evenings of Mondays, Tuesdays, and Thursdays at Nine o'clock. The Working of the Model always follows the Lecture. It is also worked at four o'clock, and at other convenient times.—The other interesting Works popular Lectures as usual.—Admission, 1s.; Schools, Half-Price.

SCIENTIFIC AND LITERARY

ROYAL SOCIETY.—June 12.—The Dean of Ely, V.P. in the chair.—A paper was read, entitled, "Electro-Physiological Researches: Memoir the First," by Professor Matteucci. The author describes several arrangements by which he was enabled to make new experiments in confirmation of the law of muscular currents. He finds that in these experiments the employment of a galvanometer is unnecessary, as the sensibility of the electroscopic frog of Galvani gives sufficient indications of the electric current, without the use of that instrument. The general results obtained from these experiments are the following:—In the first place, the intensity and duration of the muscular current is independent of the nature of the gas in which the muscular pile is immersed. Secondly, it is altogether independent of the cerebro-spinal portion of the nervous system. Thirdly, the circumstances which exercise a marked influence on its intensity are the conditions of the respiratory and circulatory systems. Fourthly, those poisons which seem to act directly on the nervous system, such as hydro-cyanic acid, morphia and strychnine have no influence on the nervous current. Fifthly, sulphuretted hydrogen has a decided influence in diminish-

ing the intensity of the muscular current. Sixthly, the intensity of this current in frogs varies according to the temperature in which the frogs have been kept for a certain time during life; a result which, of course, is not attainable with animals which do not take the temperature of the surrounding medium. Lastly, the intensity of the muscular current in animals increases in proportion to the rank they occupy in the scale of beings; and, on the other hand, its duration after death is exactly in an inverse ratio to its original intensity. The author concludes by stating his belief, that the property of the muscles immediately connected with their electric currents is identical with that which was long ago denominated by Haller *irritability*, but which is at present more usually designated by the term *contractility*. He ascribes the development of this muscular electricity to the chemical actions which are attendant upon the process of nutrition of the muscles, and result from the contact of the arterial blood with the muscular fibre. He conceives, that in the natural state of the muscle, the two electricities thus evolved neutralize each other at the same points at which they are generated; while in the muscular pile contrived by the author a portion of this electricity is put into circulation, in the same manner as happens in a pile composed of acid and alkali, separated from one another by a simply conducting body.

INSTITUTION OF CIVIL ENGINEERS.—June 10.—Sir John Rennie, President, in the chair.—The paper read was by Mr. J. Stirling, and described an Air Engine, invented by his brother and himself. The movements are founded upon the well-known pneumatic principle, that air has its bulk or pressure increased or diminished in proportion as its temperature is raised or lowered. The application of this principle was exemplified by drawings, and a model exhibiting a machine composed of two strong tight air vessels, connected with the opposite ends of a vertical cylinder, in which a piston works in the usual manner. Within these air vessels are suspended two air-tight vessels, or plungers, filled with non-conducting substances, and attached to the opposite extremities of a beam, capable of moving up and down alternately, to the extent of one-fifth of the depth of the air-vessels. By this motion of the plunger, the air which is in a heated state below is moved to the upper part of the vessels, and in its transit traverses a series of vertical capillary passages between three metallic plates, which absorb the major part of the caloric. The remainder is taken up by a refrigerator of tubes filled with water. The air at the heated end is about 700 degrees, and has a proportionate pressure; when it arrives at the cooled end it is reduced to about 150 degrees, and the pressure diminished to a corresponding extent. Therefore, as the internal vessels move in opposite directions, it necessarily follows that the pressure of the condensed air in one vessel is increased, while that of the other is diminished. A difference of pressure is thus produced upon the opposite ends of the piston, and a reciprocating motion results, which communicates through a beam, connecting rod, crank, and fly-wheel to the machinery when driven. Machines on this principle were stated to have been worked, for some years past, at Dundee, with considerable saving of fuel, as compared to a steam-engine of similar power, and doing the same work. It is now proposed to adapt it to marine purposes, to which, from its simplicity and slight expenditure of fuel, it appeared well fitted.

ENTOMOLOGICAL SOCIETY.—June 2.—The Rev. F. W. Hope, President, in the chair.—Various new species of insects were exhibited, including a fine species of *Tricentenotoma*, from the Himalayas, by Capt. Parry, the male of the rare and singular *Dorthis characis* by Mr. Weir, an apparently new Tortrix, by Mr. Douglas, and living specimens of the rare *Rhynchites cupreus*, by Mr. S. Stevens. The President alluded to the destruction caused by the white ants and other insects to the wooden sleepers of the railroads in India; and the kyanizing process having been alluded to, Mr. J. F. Stevens mentioned that he had observed *Thanasimus unifasciatus* on palings at Camberwell, but that they avoided the kyanized staves. A letter from Capt. Boys, addressed to the secretary, was read, containing notes "On the Economy of *Dorylus myrmeleon*, a species of Tetrax,

which swims with great agility, and other Indian insects, and also a paper by Mr. Westwood, "On a new genus of Carabidae from Ceylon."

MEETINGS FOR THE ENSUING WEEK.

SAT. Asiatic Society, 2 P.M.
— Horticultural Fête, Chiswick.
MON. Geographical Society, half-past 8.
— British Architects, 8.
TUES. Civil Engineers, 8.
— Zoological Society, half-past 8.—Scientific Business.
— Medico-Chirurgical Society, half-past 8.
WED. Geological Society, half-past 8.
THURS. Royal Society of Literature, 4.
— Medico-Botanical Society, 8.

FINE ARTS

BRITISH INSTITUTION.

ALONG with the pictures which this Institution exhibits annually, it has also exhibited annually for some years past what is much less agreeable to behold—symptoms of its own precipitate decline. From having been long conducted on a scale as liberal as its purpose was noble—it has dwindled of late into a poor, pickled, eked-out show, that better befitted a country town than the metropolis, and had done a set of country squires great credit to get it up, but the aristocracy of England very little. Instead of ancient masterpieces in judicious ordonnance and splendid array, the saloon walls have too often presented us old copies or counterfeits or third-rate originals, huddled together without system or scientific aim—instead of grand epic and dramatic subjects, Dutch interiors, and scenes of low life, or of inanimate nature, which, however fine these landscapes may be, are but *still-life* compared to representations of human action and passion—instead of time-honoured works that even by their magnificent well-harmonized tints, or mellow, impressive tone, could teach the mind through the senses, meretricious modern daubs only fit to misinstruct the one while they deprave the other: at a word, instead of an Exhibition where chefs-d'œuvre contended for admittance, the chief saloon perhaps furnished with some half-dozen good pictures, the second and third for the most part filled with rubbish and refuse, the shabbiest assemblage of make-shifts and stop-gaps, ancient or modern possible. We have more than once animadverted upon this very supine, and it would appear supercilious conduct towards the public; moreover, we have justified our animadversions by certain facts showing what wretched outcasts from all respectable collections are received into the British Institution, as mental provender choice enough to regale the amateurs and artists of the metropolis who feed their eyes at that fashionable manger. It is scarce a week since another such condemnatory fact came under our notice: an indifferent production of an indifferent painter, the late H. Thompson, "A Nurse and Child," its very title mean, its subject now-a-days ominous of the insipid and ignoble, was exhibited here last season but one, with several master-pieces little better than itself by the same limner, yet we saw it knocked down for thirty guineas in a crowded auction-room, and suspect it did not procure even for this low price a veritable purchaser! Like the frank-spirited Elizabethan poet,

We love plain naked terms, stript to their shirts, but were we as bland-spoken as Zephyrus when he woos Aurora, surely our epithets "refuse" and "make-shifts" will be deemed the gentlest at all appropriate or expressive after the fact just mentioned. We could cite many a similar one, or still worse.

As the long-delayed creation of a National Collection besides other less obvious causes, suggested the British Institution, and as the former now exists, and promises to live on, either lingering or flourishing, the latter seems to think it should forthwith sicken and die. We submit that there is not any such transmigration of souls needful between the two establishments: that the British should by no means feel itself bound to give up the ghost because its brother exhibits a vital spark, but rather that it should take restoratives, and from its present valetudinary state regain its pristine vigour. Such restoratives it possesses in the shape of pictures far outnumbering and outweighing those, with a few exceptions, of the Public Collection; let it take them internally once per year at the proper season, and we promise it rapid convalescence, healthful existence, and a postponement of its last day *sine die*. We say "at the proper season," inasmuch as it

strikes us an improper one has been latterly selected, perhaps we ought to have said *half* a proper one—for the exhibition being put off till the middle of June, is defrauded of its first and better half, subsists in truth but about six weeks till the session ends, and the Old Masters are left forlorn, like Old Maids, by their admirers, whom the charms of that ever fresh, young, delicate paintress, Nature, seduce to her exhibition, where she exhibits *herself*, the veritable Goddess of Beauty who rose from ocean six thousand years ago, yet remains not a tittle less attractive than she was on her birthday when the Sons of God shouted with joy to behold her. Nature has "put us out" a little: we repeat, it is an injustice and an indignity committed against the Ancients to exhibit their productions at the fug end of the session. Why do the Directors so order it? Let us give their motive the best gloss, and answer—because they wish to accomplish too much, a double exhibition in one season, what no other Fine Art directorate attempts, or has attempted with success. An exhibition of Modern precedes this of Ancient Pictures, and thereby takes place itself a full month earlier than it ought, just as this a month later. Thus both are excluded from the most enjoyable month of all, May, and thrust toward the respective solstices, when cold and heat petrifies or dissipates public enthusiasm: neither is frequented except at first, while flippant sight-seers and gossip-gatherers by profession swell the little group of real amateurs; but after a week or so these grand Saloons seldom exhibit more than a single visitor wandering amid their solitudes, the picture of desolation and dejection! Thus between the new stool somewhat rickety, and the old let grow rotten, placed wide apart, without connexion or common base of support, the British Institution must, we fear, make the adage good, and come soon to the ground. It does not seem a Colossus which has obtained such firm footing upon its pedestals in Pall-Mall as to stand astride there until an earthquake overturn it.

If the aforesaid double exhibition portend, as it appears indeed to have long threatened, the decline and ultimate extinction of either, what should be done? Precisely what no person can expect will be done. Pall-Mall and Suffolk Street should unite artistic establishments, forces and resources. The works of Modern Artists that enrich, or impoverish, the walls of these now separate galleries, should form, we think, a consolidated exhibition at one of them, while the Ancient Pictures should have the other,—let us say (from their prior and loftier claims) the British Institution, whose limited area likewise seems best suited to their small number. But as well might we expect to see porcupines housed with serpents as the Pall-Mall committee with the Suffolk-Street council. Alas for our most Utopian project! Plato would not have suggested such in his visionary Isle of Atlantis, nor Bacon in his, nor even Swift in his Laputa! We will forbear enlarging on what excellent results cluster around its hypothetical adoption: how noble a display of Modern British Pictures might be made out of two miserable shows; how grand a National Academy the combined establishments would prove, and how brave a competitor for public honours against the Royal Academy, whilst their pygmean efforts to war upon King Stork and abate his tyrannous pride can gain them neither credit nor success, as long as their own petty pretensions keep themselves at discord; how beneficial to Art a high-motived, large-minded emulation like this would become. Away with all such unrealizable hopes and wishes! One thing, however, appears certain: London, though populous and opulent, inquisitive and idle enough, is unequal to the adequate patronage of *three* exhibitions every season, when they are similar in character, even if two alone of them are simultaneous.

Perhaps the directors of the British Institution will defend their double exhibition by the plea that they can ill afford to let the Ancient Masters monopolize their saloons, and the less so as they do not "draw;" that the Modern Artists "pay;" and that money profit to themselves is the true index of moral to the public. A speculative company's oracle, we grant, speaks from the bottom of their purse, but like every other oracle it perplexes with heathenish falsehood the simple, sacred truth. We feel convinced, much loftier, sounder reasons than these

argumenta à crumend influence the directors, who doubtless know it will sometimes be their duty to take their principles of action from higher sources than Adam Smith and their doorkeeper's account-book. They must sometimes purchase moral benefit for the public at a considerable money-sacrifice; they must urge, nay even force if possible, such benefit on the public, in hope that it may be appreciated, and repaid hereafter. We would add but a few words more concerning this point; popular criticism, albeit shallow and short-sighted still, has improved a little within the last few years, and "make-shift" exhibitions are not now beheld with the same foolish face of praise, greeted with the same indiscriminate applause, the same frivolous titter of delight, nor thronged to by the same crowds of enthusiasts whom their ignorance made so far forth idiotic, as formerly.

The present year's Exhibition of Ancient Masters is better than the last, and far better than the one before that. If it contain but a small and solitary specimen of the first class (*Raphael's* 'Madonna' picture), various second and third-rate works are very attractive, some beautiful, none of any kind eyesores. There will always be, of course, the full proportion of heavy ballast to the cargo. We do not observe in the storage-rooms, this year, an unreasonable allowance of rubbish, and little exists altogether worthless—pig-iron has its value. Even *Sir Thomas Lawrence's* 'Coriolanus,' over the middle saloon chimney-piece, possesses a merit which raises it above a mere "stop-gap," as it illustrates the curious phenomenon how so delicately-inspired a portrait-painter could so coarsely conceive and clumsily execute a historical, or semi-historical subject. On the whole, we acknowledge a move backward to have been made by the British Institution from its descent, and trust that it will recede to its former high level. But *difficilis ascensus Avern!* Let the Society bestir itself—an old tower is near its fall when it nods. No supineness should be indulged; nor should the mere lethargic munificence of Directors in contributing pictures pass for fulfilment of duties. Vigilant, active, and unanimous exertion can alone arrest decay, if it has once pronounced itself. We admit they have many obstacles to contend with, albeit, we think few are as insurmountable as they seem. One, for example, it appears is the reluctance which proprietors of metropolitan collections feel to disgorge them in session-time, because they prefer getting up an exhibition at home, and desire that their mansions should particularly then make the handsomest show, perhaps, to renowned guests and visitors. Surely, however, the self-same session-time must make proprietors of all save metropolitan collections, of all those scattered throughout the provinces, contribute their pictorial treasures with the more good will, or the less grudge, because they just then have comparatively little need of such domestic ornaments. It may be double trouble, and treble expense to import these rural master-pieces from Castle Howard or Wilton, instead of Dutch cabinet specimens from Piccadilly or Grosvenor-square; but would not tenfold reputation, esteem, and gratitude accrue to the Directors? We shall next week notice the Exhibition in detail.

MUSIC AND THE DRAMA

HERR STAUDIGL has the honour to announce that his FIRST ANNUAL GRAND EVENING CONCERT will take place at the Hanover-square Rooms on WEDNESDAY, June 24th, to commence at Eight o'Clock precisely, on which occasion he will introduce some new German Social Songs, composed by himself, assisted by the following celebrated artists:—Vocalists—Messrs. Hasselt Barth, Rainforth, Novello, S. Flower, Barrett, A. and M. Williams, Messent, and W. H. Seguin; Messrs. Manvers, W. H. Seguin, John Parry, Herren Pischek and Staudigl. Instrumental Performers—Pianoforte, M. L. de Meyer and M. Simon; Violin, M. St. Leon; Horn, Signor Puzzi; Violoncello, M. Haussmann; Oboe, Mr. Gratton Cooke. Conductors—Messrs. Benedict and Hatton. Seals and Tickets may be had at all the principal Music-warehouses, and of Herr Staudigl, 8, Tavistock-row, Covent-garden.

BEETHOVEN'S CHAMBER MUSIC.—Were we disposed to boast, we might (judging from the past week's performances) go the length of declaring that the greatest instrumental composer is nowhere so diligently honoured as in London. The last evening of the *Beethoven Quartett Society*, and the last two of *M. Moscheles' Matinees*, and the relish with which both were enjoyed, give us warrant for such a fancy. The two entertainments, it is true, do not stand on the same footing: the first was so limited in its subscription, and so private in its arrangements, that

nothing but its excellence would warrant our mentioning it among the public music of the season—whereas the second was an appeal of the choicest kind, to all lovers of art, made by a thoughtful and accomplished musician. But, in this very variety, the extent and honesty of our English admiration for Beethoven is shadowed forth.—To review the dozen matchless specimens performed on these three occasions, and ranging from the master's simplest to his most complex epoch, would lead us beyond our present limit. Such opportunities of hearing them as have been recently afforded us, cannot "sink in the ground"—and future occasions will not be wanting, which can be improved by tracing the noble outlines and exquisite details which characterize the earliest as well as the latest of his compositions.

We cannot part from these Beethoven performances, without a word in recognition of the youngest of the quartett-players. We have already attempted to characterize the talent of the *Milles. Milandoli*, and must now add to former notices, that *Mlle. Teresa's* leading of Beethoven's quartett in a major for the *Beethoven Quartett Society*, satisfied us that she possesses that high and profound feeling which is required for this choicest of music—no less than the skill and composure, not attainable by the *scholar*—and, therefore, an unmistakable token of the mature artist.

CONCERTS OF THE WEEK.—These have been numerous: in proportion, however, as the principal novelties of the season have now been announced and commented on, the task of reporting becomes lighter. At *Mr. and Mrs. W. Seguin's*, for instance, we need but mention the increased care and finish of the concert givers, which tells as it should do—raising music, which used to be only a make-weight, to a substantive and separate attraction. Then, we shall only allude to two or three concerts given for divers charitable purposes as having taken place, to declare that every day brings us in unsought-for proof of the small amount of free-will exercised by the musician on such occasions: and the manner in which the compliance of one, when wearied or cajoled into acquiescence, is brought to bear upon his comrades.

M. Benedict's Monster Concert calls for a paragraph to itself. It will, perhaps, serve for index of the musical taste of those for whom he caters, that the throat-rattle given out by Signor Fornasari as a sort of make-believe cadence to his romance from 'Beatrice di Tenda,' won him one of the two *encores* of the morning—the other falling to Mr. John Parry's share. Madame van Hasselt Barth made her first appearance with Herr Staudigl in a Germanized Italian duett from an opera by Nicolai. It would be unfair to pronounce on her voice: since she is known to have been ill since her arrival in London—but we think the impression she made will bear out the character of our correspondent [*Athen.* No. 883] when it is taken into account, that on Monday her performances had to stand comparison with such a young voice as Madame Castellani's, and with Madame Grisi's still undiminished splendours, and with the incomparable execution of Madame Dorus-Gras. The mention of the last lady's name gives us occasion to mention the *braura* from a MS. French opera by M. Benedict, which she sung. This is brilliant and effective—though heard, as all stage music is, at a disadvantage (especially when there are no associations to help the audience) without the stage and the orchestra. When we have said that the programme consisted of upwards of forty *morceaux*—all lovers of their kind, we are sure, will excuse us from the task of mentioning its several items. The audience, however, bore proportion to "the goodly scheme."

MUSICAL AND DRAMATIC GOSSIP.—The inauguration of the Beethoven Monument will be celebrated at Bonn, by a festival, which is to continue three days, the 11th, 12th, and 13th of August next, and be under the presidency of Dr. Breidenstein, one of the most learned of the German writers on music. Exactly at noon on the 11th, the statue is to be uncovered—a grand mass by Beethoven having been previously executed at the Cathedral, where the Bishop will officiate. *Liszt*, who is a subscriber of 400*l.*, and offered besides to make good, out of his own pocket, any amount of

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deficiency in the subscriptions (which, however, exceed the demand), has set to music a cantata written for the occasion by Dr. Woolf, professor at the University of Jena. There will be five concerts during the festival, with two thousand performers; amongst the ladies, is the Baroness de Dingelstadt (Jenny Lutzer), and amongst the gentlemen, besides List, — MM. Auber, Halévy, Berlioz, Spontini, Meyerbeer, Mendelssohn, Spohr and Fétis have been invited. The bronze statue of Beethoven, modelled by Herr Hahnel, of Dresden, has reached Bonn. It is 6 feet in height; and will stand, on a pedestal of red granite, in the centre of the square of the Cathedral.

The idlers of Paris are flocking in numbers to gaze on the open circus, called the Hippodrome, and modelled after the Roman Coliseum, which is fast advancing to its completion in the neighbourhood of the *Etoile*. Stakes driven into its vast arena already mark out the path of the antique chariots which are to revive the Olympic contests—a hundred horses have been purchased for the service of the establishment—and the inauguration is announced for the 22nd of the present month.

Few rumours besides these are stirring this week. The engagement of M. Laget at the Paris Grand Opera is one; the *début* there of M. Paulin, another. The new lessee of *L'Opéra Comique* seems beginning his career in "hot water," by announcing the production of translations as part of his system—a folly not to be sufficiently reprobated, seeing that he has at his disposal a school of composition complete, popular, and entirely adaptable to French executive powers and French sympathies; and that, so far from translations having ever pleased in Paris, even the foreign composers who have written for the French stage, — whether it be Gluck, Sacchini, Spontini, Rossini, or Meyerbeer,—have been compelled to Gallicize themselves in style. This plan of versionizing, indeed, can only be defended where no national music is in being. One more report may be noted,—of an opera given at Braun with success, composed by Mr. Hugh H. Pierson. Can this be the Edinburgh ex-professor, already known by his settings of some of Shelley's songs?—Lastly: the first appearances, in London, of Madame Rossi-Caccia, and M. Barilhet, are announced for next week: to take place in Donizetti's *Roberto Devereux*.

"After the whales, the minnows." The plan, which seems just now to be in fashion, of commenting on real or imaginary mistakes in a contemporary so as to convey an erroneous impression, is sheer folly unless the power of reply is believed to be thereby extinguished. Thus, the Director of the "Musical Union" and "Record," in his sixth number, makes merry at the *Athenæum's* expense, *apropos* of a slip of the pen which placed an organ in 'La Capella Sistina,' in our notice of M. Berlioz's "Musical Journeys," published some six months since [No. 894]. Now no one knows better than this same Director, that the slip was set right in the very next publication [No. 895], since he did us the honour to communicate with us on the subject. We suppose he extends his own maxim, announced in his seventh number, that "the reciprocal obligations between artists is a subject too sacred and delicate for public discussions," to the private relations of critic with critic:—and has therefore sunk the explanation.

COVENT GARDEN.—*French Opera*.—"La Part du Démon," "Les Diamans de la Couronne," and "Le Maître de Chapelle" have all done their part in justifying to the full our high praise of these Belgian performances: but the great effort made by the company during the week has been its excellent presentment of Meyerbeer's "Robert." Excellent, indeed, this may be called, even by those who have fresh and distinct memories of the work as given in the golden days of *L'Académie*; we doubt, too, whether, — even when it was produced here during Mr. Monck Mason's reign, with Nourrit, and Cinti-Damoreau, and De Meric, and Levasseur,—it was executed so completely as on Tuesday. We are sure that it was never so well relished by an English audience. The three very difficult duets, and the still more difficult unaccompanied trio of the third act were sung to a wish (due allowance being made for the vocal gifts of the artists), and accompanied by the orchestra with a steadiness and *finesse*, leaving little to

desire. In recording this, enough is told to satisfy the musician. The general public seems gradually "giving in its adherence" to these performances. There is little doubt that, by the time the series must, unluckily, close, it will be warmed up to the right point.

DRURY LANE.—The comic ballet of 'Natalie; ou, La Laitière Suisse,' was produced at this theatre on Monday, but obtained no very favourable reception.

SADLER'S WELLS.—The picturesque play of 'Richelieu,' by Sir Edward Bulwer Lytton, was reproduced at this theatre, with the author's permission, last Monday, and met with considerable success. The management deserves credit for the very elegant manner in which the drama is put upon the stage; the whole of the costume, scenery, and accessories being appropriate; and the performers carefully studied and well drilled throughout. Mr. Phelps's personation of the Cardinal was equally chaste and spirited. Mrs. Warner sustained that of Julia with much propriety of effect. Mr. George Bennett, in *Baradas*, and Mr. Marston in *Manprat*, were deservedly applauded. Establishments of greater name and resources might learn something with advantage from the style in which pieces are appointed and enacted at this suburban theatre.

PRINCESS'S.—The revival at this theatre of Mr. Knowles's touching play of 'The Wife,' has tested Miss Cushman in another new character, that of the much tried, but at last triumphant, *Marianna*. With all her usual discrimination and force, Miss Cushman exhibited more pathos and tenderness than we have yet witnessed in the part. Mr. Wallack's *St. Pierre*, also, was of great merit, having a dash and vigour seldom equalled. Were more care and judgment shown in regard to the *mise en scène* at this theatre, it might, with such performers, command extraordinary success. The manager seems to have no faith in the proverb, "There is that which scattereth and yet gathereth." But there are few theatrical directors who have the wisdom of Solomon.

ST. JAMES'S THEATRE.—A few lines must suffice to chronicle the performances of that pleasantest and most musical of French comedians M. Achard, who would seem to have been as acceptable in 1845 as he proved in 1844, since the changes in his repertory have neither been numerous nor important. To him will succeed M. Arnal, the last of Mr. Mitchell's engagements for this cheerful, and, we hope, profitable season.

HAYMARKET.—On Wednesday evening a new piece, in one act, modestly called a dramatic sketch, entitled 'The Old Soldier,' by Mr. Mark Lemon, was produced. It is, in fact, a monodrama, in which Mr. Farren enacts the part of one *Adam Lethersole* (aged 95), who returns in time to aid in the discovery of certain legal documents, necessary to defeat the designs of a fraudulent agent on his master's estate, and to restore the true heir to the property. This brief interlude possesses talent, humour, and pathos, which do the author infinite credit. The acting is admirable. It must be a favourite for many nights.

MISCELLANEA

Paris Academy of Sciences.—June 9.—M. Babinet read the report of a committee appointed to examine an apparatus for the production of artificial ice, the invention of M. Villeneuve. M. Villeneuve produces the cold by dissolving sulphate of soda in chlorhydric acid. The process appears to be rather tedious. It requires an hour, and an expenditure of about two francs, to produce seven or eight pounds of ice.—M. Arago informed the Academy that he had received a letter from M. Colla, the director of the Observatory of Parma, informing him that on the 2nd inst., at about two in the morning, M. Colla discovered in the constellation of Perseus, a few degrees above the head of Medusa (B), a comet with a very brilliant nucleus and a tail of very nearly a degree in length, almost visible to the naked eye.—Three communications of systems of atmospheric railroads were made this day.—A communication was received from M. Ducard, relative to a new system of electrical telegraphs with the aid of mercury.—A letter was received from General Dembinaki, giving an account of a simple, but powerful ventilation in use in Hungary. It is a

girouette (weathercock), the hollow cylindrical tube of which communicates with the apartment. This cylinder is connected with another horizontal cylinder, leaving a small round space between the two surfaces. The wind rushing into this space, puts the column of air of the internal cylinder in motion, and rapidly aspirates the foul air of the apartment.

A Latin Hexameter Machine.—[From a Correspondent.]—One John Clark, late of Bridgewater, and now of Paddington, for thirteen years has been occupied, as it would seem from the mere sport of the thing, and in a spirit of indifference as to what might be its subsequent use, with the invention of a machine for composing hexameter Latin verses. The invention is stated to be less difficult of realization than might have been expected. The rules of verse, Mr. Clark tells me, the measured syllables and the measured time, of dactyls, spondee, trochees, &c., which act as fetters of confinement to the writers of verses and much increase their difficulties, have an opposite effect when applied to a machine;—it being much more practicable to construct one for composing verse than for composing prose. The problem may be compared with that of forming an indefinite number of geometrical figures by a machine; Sir David Brewster succeeded in doing this in *The Kaleidoscope*; and it is this principle, carried out, which the Latin Hexameter Machine illustrates. It is capable of composing about one verse a minute. The actual verses produced in my presence are the following: each, it will be perceived, is complete in itself, and independent of the other:—

1. Horrida sponsa reis promittunt tempora densa.
2. Sontia tela bonis causant agmina crebra.
3. Rellica vota modis promulgant crimina fusca.
4. Aspera pila patet depromunt praelia quedam.
5. Effera sponsa fere confirmant vincula nequam.
6. Barbara tela reis præconstrunt nubila dura.
7. Horrida vota bonis progignunt jurgia crebra.
8. Sontia castra modis prostant somnia fusca.
9. Trucida regna quidem conquirit opera cara.

Such are the verses, the mechanical nature of which is evident by their all belonging to the same grammatical formula and scansion. The exterior of the machine resembles in size and shape a small bureau book-case; in the frontispiece of which, through an aperture, the verses appear in succession as they are composed. Since its completion it has never, I understand, repeated the same; and, being capable of several millions of changes, such an occurrence is not likely to happen. Moreover, though the visible display of the line is effected simply by mechanical movements, the conception of it is not mechanical, but "essentially an imagination only, partaking somewhat of the nature of an arithmetical infinite series." Each verse is conceived at the precise moment of time when its corresponding geometrical figure is produced by the Kaleidoscope in the machine; every identical verse with its corresponding figure, and every figure with its corresponding verse. Nor can it by any possibility be otherwise. So much for Mr. John Clark's Latin Hexameter Machine. As I have said, I do not see its immediate utility; but, as something curious, it is, perhaps, entitled to take place with Babbage's Calculating Machine, and inventions of that class.

Cannel Coal.—It is not generally known that Cannel coal can be employed in the Fine Arts, and that for the bases of statues, plinths, and a variety of other purposes, for which black marble and other fossil substances are used, this fossil can be substituted at a less cost and with less difficulty in the cutting or carving. A very elegant vase of this material, something in the shape of the well-known Warwick vase, but flatter and partaking more of the patera shape, has been lately cut out of a block of Cannel coal, or rather "turned" out of the block by means of the lathe, and the tools are similar tools to those employed in the cutting of wood or brass. The artist is a Mr. J. Dallaway, to whom it would be less than justice not to say that he has produced a most elegant piece of work. The vase stands on a fluted column of the same material. The polish, which the material of which it is composed receives with very little labour, is surprising.—It appears like the finest negro antico. The block came from the estate of the Duke of Norfolk, near Sheffield.—*Times*.

Railway from St. Petersburg to Moscow.—The *Revue de Paris* says, that no European railway will go so directly to its terminus as this. The one great

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The Patent Electro-plating process being extensively adopted under their licence, the Patentes beg to state that they confine their art manufacture to goods of a superior and warranted quality only, which involve the use of the mark, 'E & Co.' under a crown. Old articles re-plated and gilt.

SEA BATHING AT HOME.—HUMPHREYS'S

MEDICAL MARINE ESSENCE.—A little added, with or without salt, to the water used daily, for sponging, washing, or for any sort of domestic bath, has a most invigorating and refreshing influence, affording a whole luxury to the robust, and a great desideratum to the invalid.

R.—Highly strengthening to infants and young children. It is sold in bottles, 1s. 18d. each, with full instructions, by all the principal Chemists in town and country. Observe that the name is engraved on the stamp.

HEAL & SON'S LIST OF BEDDING,

containing a full description of Weights, Sizes, and Prices, by which purchasers are enabled to judge the articles that are best suited to make a good set of bedding. Sent free by post, on application to their Establishment, the largest in London, exclusively for the manufacture and sale of Bedding (no beds or other furniture being kept).—HEAL & SON, Feather-dressers and Bedding Manufacturers, 196, opposite the Chapel, Tottenham-road, London.

RECONNOITERING TELESCOPES.—

These celebrated Instruments, measuring, when closed, 3 inches, possess sufficient power to show clearly Jupiter's Moons. Its efficient performance as a Reconnoitering Telescope, both as to magnifying and defining power, renders it peculiarly adapted to the military gentlemen and tourists. Price 25s.; or sent through the post at 36s.—The same instrument, with an additional Eye-piece (Huygenian) to show Saturn's Ring and some of the Double Stars, with Stand and Case, 4s. inches by 3 inches, to contain the whole, 2s. 2d.—To be had of the Maker, JOHN DAVIS, Optician, Derby.

A NEW ACHROMATIC POCKET COM-

POUND MICROSCOPE, for Physiological and Botanical Researches, with a Triplet Achromatic Object Glass; linear power, 125. Price, complete in a neat leather case, 2l. 10s.; by post, 2l. 12s. 6d. Manufacture and sold by A. ABRAHAM, Optician, No. 20, Lord-street, Liverpool.

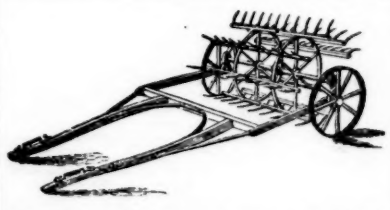
A very effective and extremely portable Instrument, peculiarly adapted for, and a desideratum to, the Medical Profession.

THE ORTHOCHRONOGRAPH, patented by

WEBSTER & SON, 74, Cornhill, Chronometer Makers to the Lords of the Admiralty and the East India Company. This newly-invented instrument will determine the correct performance of Chronometers, Watches, and Clocks, and show their distance from the correct time at any place. The simplicity, portability, and ease with which the results are obtained, will enable the most inexperienced to ascertain mean time to a correctness not hitherto attained but by experienced persons in the use of astronomical instruments. It may be adjusted to its position in two minutes. An explanatory paper, with their publication, forwarded free, upon inclosing two postage stamps. Price 4l. 10s. 74, Cornhill.

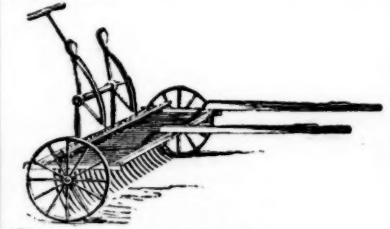
PROTECTION OF LIFE AND PROPERTY.

J. READ begs leave to inform the Public that, after 35 years' experience in manufacturing Garden and Fire Engines, he has (to avoid the piracies so long practised upon him) taken out a NEW PATENT for Improvements in his Machines, and will warrant to keep the valves in repair during the term of the patent. The above will perform the work with two-thirds the labour required for any other engines for the same purpose hitherto invented. J. R. is now manufacturing an engine which will discharge ten gallons of water per minute, to a distance of forty feet, and can be applied in an instant. Likewise, a Fire Escape that can be fixed to any window or house in two minutes.—It is wanted for a place in every hotel or mansion in the kingdom. Engines made to order that will discharge from 20 to 100 gallons per minute, which may be seen and proved at 35, Regent Circuit, Piccadilly.



HAY-MAKING SEASON.—Mrs. MARY

WEDLAKE, Widow of the late Thomas Wedlake, of the Farnham Original Iron Works, Hants, near Exeter, and 118, Fenchurch-street, opposite Mark-lane, London, begs to remind Agriculturists she continues making that most useful Implement for which her late husband obtained a patent, and received a Silver Medal at the Derby Show, the DOUBLE-ACTION HAY-MAKER, so much admired; also the HORSE HAY-RAKE. They may be inspected daily at the City Repository for Agricultural and Colonial Implements, 35, Fenchurch-street, opposite Mark-lane, London.—To prevent disappointment at this season, an early application for these implements is solicited.



METCALFE'S NEW PATTERN TOOTH

BRUSH and SMYRNA SPOONGES.—The Tooth-Brush has the important advantage of searching thoroughly into the divisions of the teeth, and cleaning them in the most efficient and extraordinary manner, and is famous for the hairs not coming loose. The Smyrna Sponges are made of the finest third part of the usual time, and incapable of injuring the finest nap. Penetrating Hair-brushes, with the durable unbleached Russian bristles, which do not soften like common hair. Brushes of improved graduated and powerful friction. Velvet Brushes, which act in the most surprising and successful manner. The Genuine Smyrna Sponge, with its preserved valuable properties of absorption, vitality, and durability by means of direct importations, dispensing with all intermediate parties' profits and destructive bleaching, and securing the luxury of a genuine Smyrna Sponge. Only at METCALFE'S Sole Establishment, 130, a Oxford-street, one door from Holles-street.

Caution.—Beware of the words "From Metcalfe's," adopted by some houses.

WATCHES by WEBSTER & SON, Chrono-

meter Makers to the Lords of the Admiralty and the East India Company.—WEBSTER & SON'S Manufacture has continued in Cornhill 134 years, where may be selected, from one of the most extensive stocks in London, every description of superior manufacture in CHRONOMETERS, WATCHES, and CLOCKS, finished under their immediate inspection on the premises, and at the lowest prices consistent with security for the maintenance of that reputation for superior workmanship which has distinguished their house for so many years. Compensated Duplex and Lever Watches, to counteract the variations of temperature, upon the principle of their Chronometers, of superior manufacture in CHRONOMETERS, WATCHES, and CLOCKS, finished under their immediate inspection on the premises, and at the lowest prices consistent with security for the maintenance of that reputation for superior workmanship which has distinguished their house for so many years. 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